

THE IRON AGE

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Sand System Yields Economies

Results in
40 Per Cent
Saving in
Floor Space



New Sand
Requirements
Cut Down,
Labor Eliminated

BY BURNHAM FINNEY*

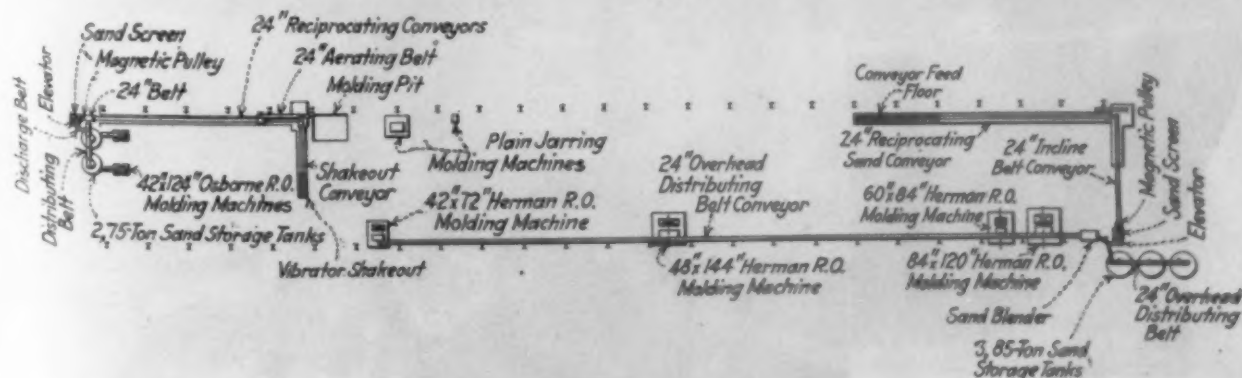
CONSERVATION of floor space, a reduction of labor costs and a substantial saving in the amount of new sand purchased each year, have been made possible in the Lima, Ohio, plant of the Ohio Steel Foundry Co. by the successful operation of a sand-reclaiming system. All handling of sand by hand has been eliminated and, aside from one minor operation, crane service in relation to sand handling has been made unnecessary.

Two separate and distinct systems for reclaiming sand have been developed—one at the south end of the

foundry and the other at the north end. At the south end, heats are shaken out on a shakeout floor, 50 x 60 ft. in area. The used sand is then put through a cutting process in which a grab bucket and overhead crane are utilized. After the sand is tempered by the addition of water and has attained a consistency suitable for molding, it is picked up by the grab bucket and placed on grates over a reciprocating drag adjacent to the shakeout floor. At that point all pieces of metal, such as broken gates and gagers, are removed.

The reciprocating drag carries the sand to an inclined belt, 24 in. wide and 65 ft. long. The sand is drawn up the belt to a magnetic pulley at the top,

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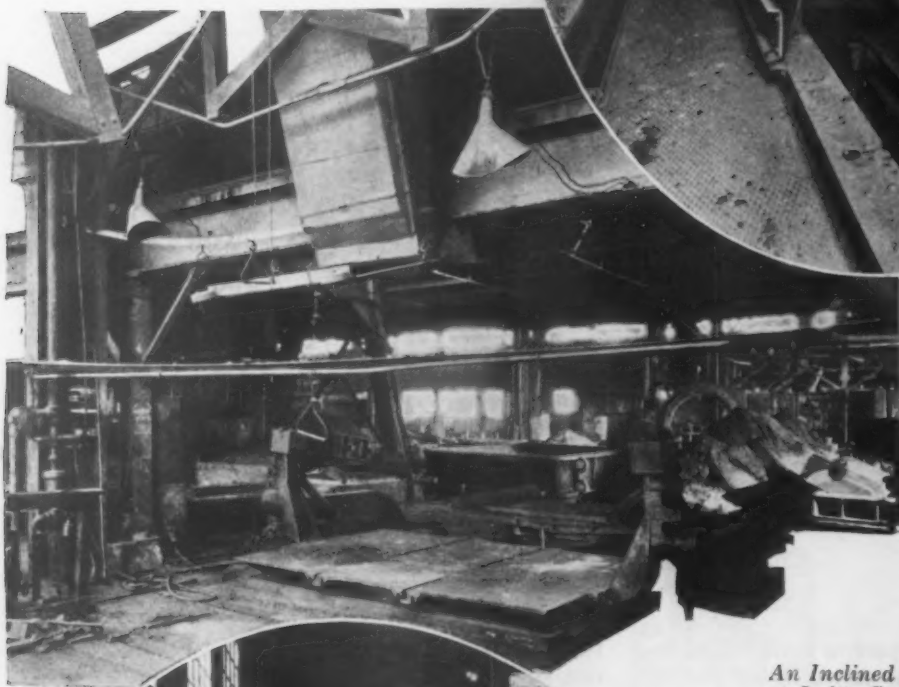


The Illustration at the Top of the Page Shows a Sand Distributing Belt That Extends 450 Ft. Along One Side of the Foundry at a Height of 70 Ft. In the plan view of plant are shown the two sand reclamation systems, one at the south end and the other at the north end of the building

Reclamation Equipment Includes Conveyors, Magnetic Separator, Screen, Storage Tanks, Blender and Discharge Chutes Hung Directly Over Molding Machines

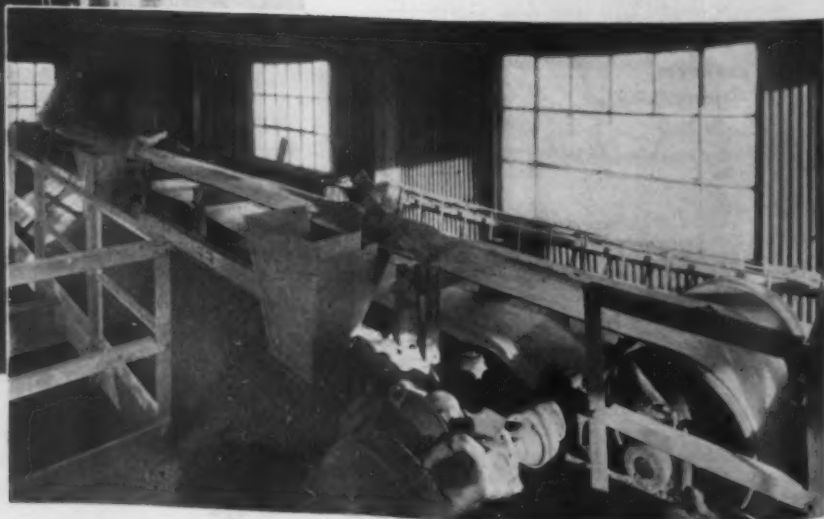
All Sand Handled in the System Provided for the South End of the Foundry Passes Through a Sand Blender (at Right) Before It Is Discharged on the Distribution Belt That Serves the Molding Machines

Sand Is Drawn Off the Distribution Belt Through Chutes Located Over Molding Machines. Sand is released as required from the chutes, one of which is shown below



An Inclined Belt, 65 Ft. Long (in Circle at Left) Carries the Sand to a Magnetic Pulley and a Revolving Screen. After screening, the sand goes either to storage tanks or directly to the sand blender

Sand to Be Stored Is Deflected through a Discharge Pipe to a Belt (Shown Below) Serving Three 85-Ton Storage Tanks. Plows, hung over the belt, divert the sand into the mouths of the tanks





In the North End of the Plant a Pneumatic Shakeout Machine Is Used to Shake Out Molds

which separates all iron from the sand. Nails go down a chute to a bench, where they are rattled and straightened for further service.

Directly beneath the magnetic pulley is a revolving screen, which removes foreign matter, such as cinders, as the sand goes through it. The screened sand drops on a belt, 12 ft. long, which delivers it to a bucket elevator. The sand is then carried to the top of the building, 70 ft. above the floor. If the molding machines in the foundry are idle, the sand is diverted to a short belt, from which it is dropped into storage tanks at the extreme southwestern end of the plant. Each tank has a capacity of 85 tons. Two are used for "live" sand, while sand in excess of the amount needed in the foundry is stored in the third. From time to time the excess sand is delivered by belt conveyor from the

tank to railroad cars on a siding just outside the building.

Live sand, either from the storage tanks or directly from the bucket elevator, is passed through a continuously functioning sand-blending machine, and thence to a distributing belt, running 450 ft. along the western side of the foundry at a height of approximately 70 ft. The belt supplies sand through chutes to four Herman pneumatic roll-over machines. When any of the chutes are not in use, they are hung on hinges beside the belt so that they will not interfere with the passage of sand along the belt to other chutes.

At the north end of the foundry is a bolster and side-frame molding department. The sand-reclaiming system here differs in many respects from that at the south end. Molds are taken directly to a pneumatic



The Two Storage Tanks Serving the System at the North End of the Foundry Are Shown in the Background. From the bins the sand is fed through an agitating cone to a revolving disk, which delivers it to an elevator serving the two chutes shown in front. The chutes hang directly over two molding floors

shakeout machine, of the company's own design, located at the edge of the molding floors directly over a reciprocating drag. Shaken into the reciprocating drag, the sand is transported to an inclined belt, 20 ft. in length, at the bottom of which water is added. Upon reaching the top, it drops into another reciprocating drag, which delivers it to a second belt, about 12 ft. long. It then passes over a magnetic pulley, which removes all of the iron, and drops into a revolving screen, which eliminates foreign matter. After being screened, the sand is elevated 60 ft. to a third belt, which drops it into storage bins.

From the storage bins it is fed through an agitating cone to a revolving disk, 14 ft. in diameter, which de-

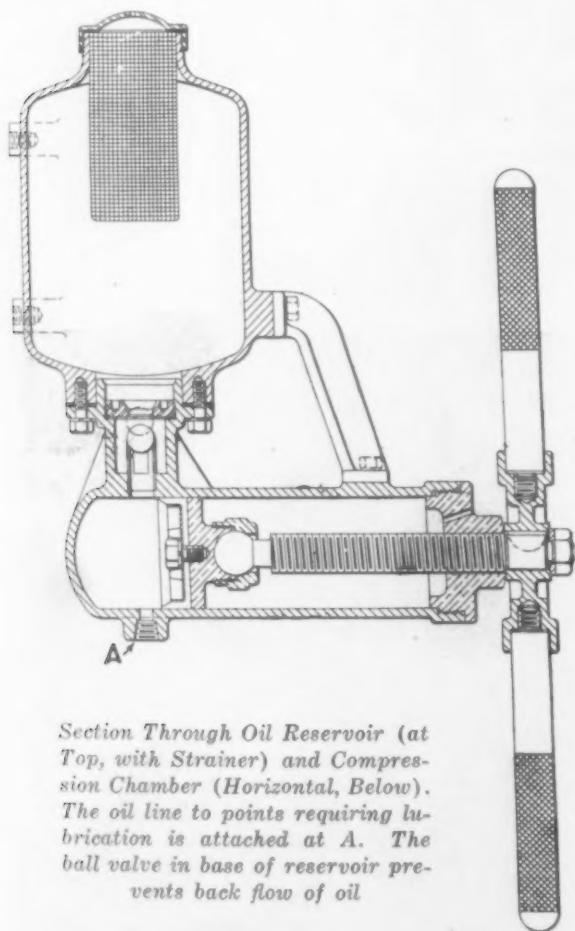
livers it to an elevator. From the elevator it passes into chutes located directly over the two molding machines. The weight of the sand in the chutes controls an electrically operated mechanism that starts and stops the revolving disk so that only the required amount of sand is fed into the chutes.

It is estimated that the reclamation of sand by means of the processes described, especially through the use of the distributing belt at the top of the building, has cut down the necessary floor space in the foundry 40 to 50 per cent. While figures showing the actual percentage of new sand saved are not available, the amount is of liberal proportions.

LUBRICATING SYSTEM

Positive, Measured Action from Centrally Controlled Point in Industrial Units

A mechanical lubricating system designed for positive lubrication with solidified transmission oil from a centrally controlled point has been developed by the Farmer Lubrication Systems, Inc., 2611 Sixteenth Street, Detroit. The system, devised originally for use on motor cars, has now been applied to uses in industrial plants for lubricating bearings of line shafting, machine tools, conveyors and other machinery. A De-



Section Through Oil Reservoir (at Top, with Strainer) and Compression Chamber (Horizontal, Below). The oil line to points requiring lubrication is attached at A. The ball valve in base of reservoir prevents back flow of oil

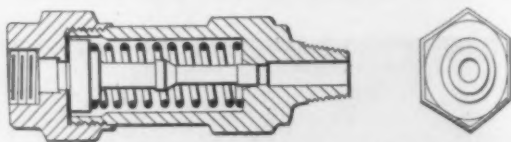
troit plant has installed the system for lubricating an extensive system of conveyors.

The system consists of four main parts: a pressed steel reservoir holding a supply of heavy oil, a screw or plunger type of compressor which exerts pressure as required, a valve automatic and positive in action connecting with each bearing through which the oil is forced, and which measures the correct amount of oil to be supplied to the bearing, and a pressure gage

mounted near the operating point, which indicates the amount of pressure in the line.

Made in various sizes, depending upon the size of the installation, the reservoir for use with single machines will hold enough oil to lubricate 30 to 40 bearings for three months. Oil passes through the reservoir bottom through a ball check valve into a compression chamber, from which it is forced into a feed line. The ball check valve prevents oil from being forced back into the reservoir when pressure is applied in the compression chamber. A screw type of compressor usually is specified for industrial applications. This is operated by hand wheels, except in large systems requiring several hundred feet of piping and supplying a large number of bearings. In these larger systems compression is effected by motor-driven gears.

The measuring valve connected with each bearing functions when pressure is applied in the compression chamber. When the lubricant is not under pressure the piston is seated against a copper gasket, shutting off the main supply line. As pressure is applied the oil forces the piston forward and the oil by-passes into the measuring chamber of the valve. When the pressure in the valve equals that in the line the piston again moves forward, forcing the measured quantity of oil into the bearing. After the piston has traveled its full



Assembly of Oil-Measuring Valve, One of Which Is Connected with Each Bearing to Be Lubricated

length it seats, shutting off the entrance of any more oil into the bearing. When pressure is released a spring forces the piston back to its original position and the system is ready for the next application of the lubricant.

When using valve bodies and pistons of uniform size, the amount of lubricant to be delivered to each bearing is regulated by making the valve seats various distances from the piston heads, thus regulating the distance that the piston travels. The valves are made in various sizes to meet the requirements.

Advantages claimed for the system include proper lubrication for each bearing at any required pressure, quick operation, reduction of the labor cost of oiling and the elimination of the danger of accidents in oiling bearings that are difficult to reach.

Production of tin cans and packages in 1925, according to reports to the Bureau of Census, was valued at \$235,736,120. Milk and ice cream cans were produced to the value of \$5,784,199 and other products from plants engaged in the production of tinware were valued at \$18,839,642. This represents a total of \$260,359,961, an increase of 20.6 per cent, as compared with \$215,971,256 for 1923, the last preceding census year.

About Buying Drop Forgings

Where the Dies Belong, and Why—Upkeep and Replacement Expense—Cost of Rejections Heavy

BY H. KILBORN*

IN quoting on special forgings we make the following reservation, "Charges made for dies and tools do not convey ownership nor the right to remove them from our possession, but they do convey the right to their exclusive use." We are oftentimes asked why we make such a reservation.

This condition may at first seem to the buyer of special forgings as an attempt on the part of the forging company to create for itself a monopoly, thereby allowing it to charge the customer on subsequent orders almost any price it sees fit.

If this were the purpose of such a reservation, and if the forging company followed that plan, in a short time that fact would be apparent to the purchaser. Although he might continue to order repeat lots at an unreasonable price, still he surely would never order from that company any more new pieces requiring new dies. Hence the forging company would eventually find itself in a position where it had no new work, and, as the old pieces gradually became obsolete, the forging company would have no business at all.

Because the forging company is sensitive to the fact that this reservation may appear to the buyer in this way, it is careful that the actual facts shall clear it of any suspicion of attempting to obtain an unreasonably high price on forgings. This condition or a similar one is used by most drop forging companies, and it is used to avoid the evils which would exist if it were not used.

Dies Would Not Fit Hammers

Suppose that no such condition existed anywhere. In that case the purchaser would place his initial order for forgings with that concern which quoted the lowest total number of dollars on the combined forgings and dies. The second time he required the same piece he would place his order with that concern that quoted the lowest price on the forgings only, and would have the dies shipped to that concern.

First of the difficulties encountered would be the fact that the dies probably would not fit the hammers of the second forging company. This is because there is no standard in the forging industry for the shape of the shanks of the dies, or, in other words, the shape of the portion of the die which is used to hold it in the hammer. If the shanks on the dies were soft they could be reshanked to a smaller size, but not to a larger one without planing off the entire shank and making a new one, which treatment the die would stand as long as there was sufficient metal. (Adapters to accommodate a small shank die to a larger shank hammer are not particularly successful.)

If the shanks of the dies were hardened it would be necessary to anneal the dies, and then reshank, the same as if they had been soft, and then reharden. There is always risk of breakage in heat treating, and an especial risk in reheat-treating dies. The second forging company would undertake that work only at the risk of the owner of the dies, which in this case would be the customer.

Dies Not Standard with Second User

The next difficulty encountered would be that the dies were not designed and made according to the way the second forging company would make them. Each forging company has its own way of designing and making dies, and, although they all may be good,

nevertheless each one prefers the style or method which has apparently given the best results in its own practice. The second forging company then could honestly claim that the design of the dies was such that the rate of production would be less than that estimated, and therefore the price would have to be raised.

To illustrate this, suppose the first forging company regularly made the edger on the right, the blanking impression on the left, the finishing impression in the center and the cut-off on the extreme left rear corner. All the men in the first company would be accustomed to these positions on all dies and therefore reach their greatest rate of production on that layout. If the second company's layout were different and its men were accustomed to a different arrangement, although it would be quite true that the dies would produce the forgings, nevertheless the rate of production would be lower for the second company, because the layout was not standard for it.

Running the Dies to Death

Next and probably the most expensive difficulty is that all forging companies would be using sets of dies which they did not own, and in the upkeep or replacement expense of which they had no interest. The majority of purchasers of drop forgings do not realize that the hammer operator has considerable to do with the life of forging dies. A little more care on the part of the operator will greatly increase the life, whereas strict attention to rate of production only, may ruin a set of dies very quickly. Some operators are particularly poor in this respect and it is not uncommon to hear an operator described as "Fast, but hard on dies."

It would be natural for the second forging company to attempt to produce the forgings in the least time and without attention to the life of the dies. And, as it would be necessary for the customer himself to purchase subsequent sets of dies, and as the life would be less than if the forging company had to stand that expense, the expense to the customer would be greater.

These three difficulties have caused drop forging companies, as a whole, to make reservations in regard to dies. But the reservations are, in the end, actually an advantage to the purchasers of forgings. The price originally charged the customer as a die charge is not the selling price (i.e., cost plus profit) for a set of dies and is not generally even the total factory cost of making the dies.

Die-Replacement Charge on Forgings

The price paid for the forgings includes a charge known as die replacement, which is a reserve set up by the forging company to compensate it for making a new set of dies when the first set is worn out. It is necessary for the forging company to reach a proper balance between the rate of production, as it affects the life of the dies, and the die replacement cost, so that the ultimate cost per forging shall be at a minimum. This is because the purchaser invests in the original set of dies only, and is not charged for any subsequent sets which may be necessary, the expenses of which are distributed over the forgings by the die replacement factor.

Each purchaser of forgings, especially when purchasing in less than life-of-the-die quantities (this quantity may be anywhere from 100 to 200,000, depending on many factors), should preferably select a forging company which he knows to be reliable and

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give it the order, either with or without a previous estimate (not a definite price quotation) of its cost.

A "broadcasted inquiry" will bring as many prices as there are quotations, and none of them have any definite relation, either to the cost of producing the first lot or to the price which will be charged for the second lot. In the first place, estimates of cost on the first lot are estimates only, or, in everyday language, guesses. And the estimator is human, "even as you and I." And second, there may be any amount, either added to the estimated cost for profit, or deducted and charged to advertising.

Cost Plus a Return on Investment

Reliable forging companies, under normal conditions, generally will quote on a new piece what they actually think will be the selling price when sold subsequently under the same conditions. But, regardless of the original price and the motive behind it, every forging company must, on the average, charge cost plus a return on its investment, or the purchaser will eventually have to find a new source of supply.

All forging companies probably quote on that basis on the second run. If the purchaser "buys dollars" on the original order he has no legitimate complaint if the price is increased on the second run, which simply means that the forging company either has discovered its error in estimating or is not willing to continue to charge profits to advertising.

It is a common saying in regard to straight price competitive bids on first runs that, if the forging company's guess is high, it loses the order, and if low, it loses money. It loses either way.

A competitive bid by a forging company which has not made the piece before, against one which has made it several times, is no more indicative of an unreasonable price on the part of the latter than the prices on the original inquiry were, and for the same reason. How often is heard the plea of the salesman to "quote low, to get started with them."

The purchaser who "buys dollars" generally gets dollars and the one who buys forgings for quality will get quality. If the forging company understands what is necessary in regard to size, surface condition and quality of material, it will try its best to supervise its production to obtain the results desired, the same as if the forgings were being produced under the eye of the purchaser. "We aim to please" is no idle saying in any business.

But, the closer the specifications, the higher the cost, and that is no idle saying, either.

One Company's Experience

This company had an amusing experience not long ago. We were successful bidder (whether lowest or not we do not know) on a large quantity of a single forging. About the middle of the run we were asked to quote on another lot of the same forging, but slightly changed in design. We did, but no order was forthcoming, and the reason given was: "Too high."

A short while later, and before we had completed the first order, the buyer who was dealing with us took his usual vacation, unknown to us. During his absence we received one of those polite but scathing letters asking us how it was possible that two forgings, which they were sending under separate cover, could be produced out of the same dies, and still be so different, and stating that the lot just received was not within striking distance of the size specifications and stood rejected, etc.

Now, letters like that raise blisters on whoever is responsible in our organization. After the first smoke had settled a little, someone suggested that it might be a good idea to defer any further battle until Uncle Sam, with his slow but sure methods, delivered that "separate cover." When, a day later, we hurriedly opened the package, lo! they were the new design and the "other fellow's" product.

A few hours later a representative of our company was in conference with their purchasing agent, superintendent and master mechanic. After they had freely pointed out the error of our ways, we fully admitted all their contentions as regards size, and also (we

blush somewhat at telling this) pointed out that the steel had been overheated and ruined. As they were furnishing special steel for the job, that was an added thorn. We then asked them to look up the copy of the original order for the new design pieces. After they had done so, peace was declared. There then existed what might be termed "The situation any salesman loves." A few days later we received their order.

High Cost of Rejections

The whole point of this is that we were checking size frequently, running a reducing flame on the furnace to avoid scaling, and running a low temperature to avoid burning (it was a peculiar steel in those respects). Consequently we had a higher cost than otherwise, but there were no rejections.

Rejections cost many times the value of the pieces involved, in inspection, delayed production, faulty production, charging back, and above all in irritation. As it is impossible to reduce these things to dollars and cents, they are not added to the price of the low bid, as they should be for a proper comparison, but are, oh, so surely, added to the profit-and-loss statement at the end of the year.

Catalog of American Equipment

A catalog and directory of American mechanical equipment having 1076 pages 9 by 12 in., with 2800 illustrations, has been printed in Russian by the Amtorg Trading Corporation, 165 Broadway, New York, purchasing agent of metals and machinery for the Soviet Union in the United States. There are 643 pages of illustrated advertising of American products, followed by a section of 155 pages listing American manufactured products alphabetically with names of makers. Seven thousand items are listed and 45,000 names of firms and corporations are mentioned.

A section of the book is devoted to 28 articles by American technical experts on various phases of American manufacturing development. Among the contributors are: Col. Hugh L. Cooper, builder of Muscle Shoals; Prof. Vladimir Karapetoff of Cornell University, consulting engineer of the General Electric Co.; S. Q. Hayes, Prof. D. E. Vinogradoff and other engineers of the Westinghouse Electric & Mfg. Co.; Charles E. Locke, professor of mining engineering, and Edward P. Warner, professor of aeronautics, Massachusetts Institute of Technology; Allen Rogers, professor of chemistry, Pratt Institute; R. M. Washburne, professor of agriculture, University of Michigan; Norman G. Shidle, editor of *Automotive Industries*, and others.

Fifty pages are devoted to an economic survey of the United States. To this is appended a full descriptive list of all scientific and research organizations, with their principal publications. The Amtorg Trading Corporation recently shipped 5000 of the books to Russia.

Fewer Bathtubs Shipped

Shipments of enameled bathtubs in 1926 are reported by the Department of Commerce at 1,195,142, compared with 1,325,517 in 1925, a reduction of 10 per cent. The reports are from 21 manufacturers, comprising the entire industry. Except for May and June, every month of 1926 was below the corresponding month of 1925.

December shipments were 68,133 bathtubs, a drop of 15 per cent from the 80,271 of November, and still further below the 93,242 of the previous December. The most recent month was the lowest in more than two years.

Orders received during 1926 ran somewhat ahead of shipments, having totaled 1,242,969 units. In 1925 the orders were for 1,390,086 bathtubs.

A recently invented electrical detector of fire damp or methane, the combustible gas which is responsible for most coal mine explosions, has been developed at the Long Island City laboratories of the Union Carbide and Carbon Corporation.

Burning Gas and Powdered Coal

Boiler Furnace Design for Blast Furnace Gas and Pulverized Fuel, Separately or in Conjunction

BY J. GOULD COUTANT

FURNACE design for efficient combustion of blast furnace gas and pulverized fuel requires special consideration of furnace volume and length of gas travel; also of the means for maintaining furnace temperatures. Blast furnace gas, as a fuel, differs from ordinary fuels, being composed of approximately the following analysis:

13	per cent carbon dioxide
26	per cent carbon monoxide
3.6	per cent hydrogen
57.4	per cent nitrogen

Heat value will vary with the same factors which affect the temperature of flame and will average about 92 B.t.u. per cu. ft. When burned unwashed, being delivered at the furnace at 250 deg. Fahr., the gas will have a heat value of 95 to 96 B.t.u. per cu. ft., which includes the sensible heat. The unwashed gas contains quantities of dust that melts at 2000 to 2100 deg. Fahr., which limits the temperature at which the gas can arrive at the boiler tubes and also the furnace temperature; as, when in the molten state, the particles will adhere to the furnace bottom.

Best Results with 3 Cu. Ft. per Hp.

Furnaces with a volume of 3 cu. ft. per rated boiler horsepower have been responsible for the best results with blast furnace gas. This is approximately the same volume required for burning pulverized fuel in a furnace constructed with only a limited amount of direct boiler heating surface exposed to the flame, and approximates 18,000 B.t.u. liberation per cu. ft. per hr.

Burners and flame travel are important considerations. Gas burners should be located at low end of boiler, to provide the longest flame

ing the fuel with a small amount of excess air, not to exceed 20 per cent.

Pulverized fuel burners are arranged to provide opposing flames to create turbulence, thus completely burning the gases in the furnace. Pulverized fuel

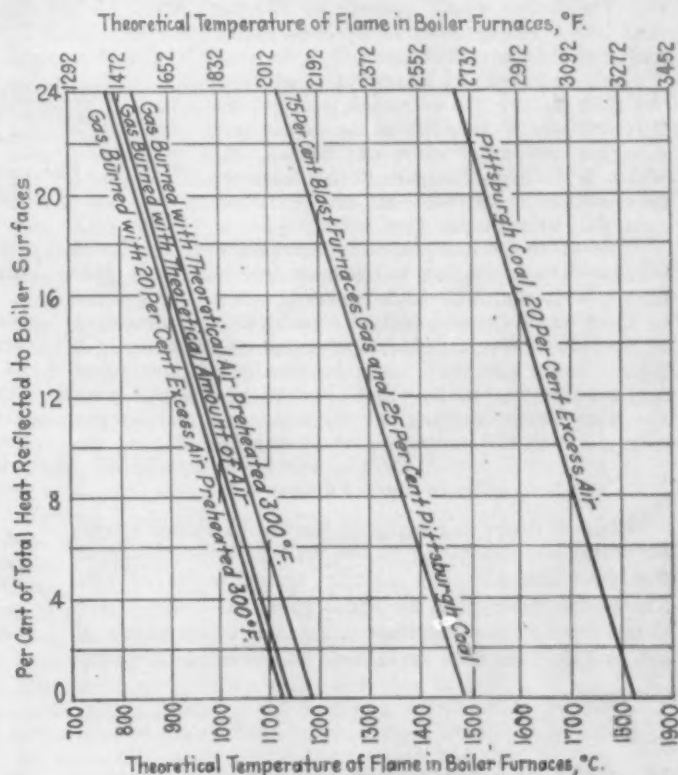


Fig. 1. Theoretical Temperature of Flame in Boiler Furnaces. Radiation loss is 2 per cent

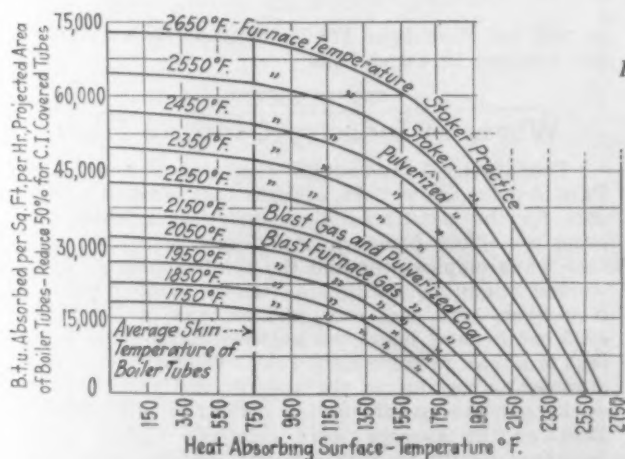


Fig. 2—Average Heat Transfer to Direct Boiler Heating Surface. The long U-flame method of combustion for pulverized fuel is the basis of the curves at 2450, 2350 and 2250 deg. Heat absorption is increased 25 per cent by the short-flame method for pulverized fuel

travel possible. The gas, entering at low velocity and at as high a temperature as possible, is thoroughly mixed with air at the burner.

Preheated air accelerates ignition and increases furnace temperatures and heat absorption of boiler, due to heat radiated to direct heating surface (see Figs. 1, 2 and 3). Blast furnace boilers, gas fired, and for burning a combination of blast furnace gas and pulverized coal, assure maximum thermal efficiencies, burn-

burners are of the induced draft type, low velocity, or arranged to receive forced draft preheated air.

Boilers designed for burning blast furnace gas and pulverized fuel will show a greater return on the investment if boilers are operated at approximately 225 per cent of boiler rating, 20 per cent of the fuel being pulverized coal and 80 per cent blast furnace gas.

Exposed Surface Important

The direct boiler heating surface exposed to the fire is of prime importance, as the temperature of ignition, furnace temperature, slagging conditions of gas-fired boilers and steaming capacity of any coal-fired boiler are all controlled by the amount of such surface exposed to the fire.

One 1600 hp. boiler designed for water floor will operate normally, at 200 per cent boiler rating, at 75 per cent boiler efficiency, burning blast furnace gas. The projected area of direct boiler heating surface is approximately 200 sq. ft. But with pulverized coal it can be operated only at 125 per cent of rating at 12 per cent CO₂.

Placing two rows of tubes exposed to the fire and increasing the direct heating surface to 300 sq. ft., it would then be possible to maintain 78 per cent efficiency, and 180 per cent boiler rating at 12 per cent CO₂, with pulverized coal as a fuel, without the slagging of blast furnace dust or coal ash.

With two rows of tubes exposed to the fire, the

boiler efficiency would be approximately 70 per cent with blast furnace gas, unless a small amount of pulverized fuel was burned in combination with blast furnace gas.

Using a Water Floor

There is such a vast difference between the characteristics of blast furnace gas and pulverized fuel that it is apparent that some constant-temperature furnace should be employed. To this end a boiler may be equipped with a water floor on which ash and dust may be allowed to accumulate during the period that it is desirable to burn blast furnace gas. The furnace would then have an effective direct heating surface of 200 sq. ft. The boiler would operate at 225 per cent boiler rating with 73 per cent boiler and superheater efficiency.

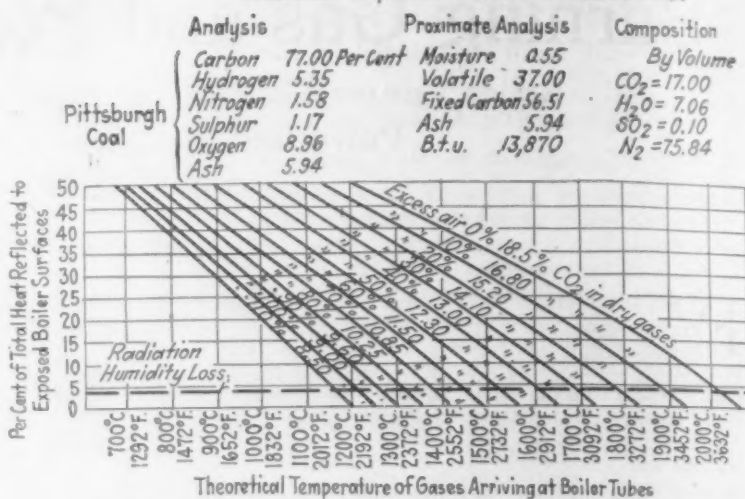
Ash and dust can be swept clean from the floor by the use of steam jets and the furnace would then have an equivalent effective projected area of 350 sq. ft., which is sufficient to permit the boiler to be operated at 225 per cent rating, 12 per cent CO_2 , and 78 per cent efficiency.

Use of the water floor eliminates the necessity of burning a combination pulverized coal and blast furnace gas to maintain high economy when it is desired to burn gas. Consequently it would not be necessary to operate pulverized fuel equipment at all times. A higher boiler efficiency could be obtained if two tubes are exposed to the fire and the boiler equipped with the water floor burning 20 per cent coal and 80 per cent gas, and 100 per cent coal when required.

Limits in Blast Furnace Gas

Blast furnace gas firing is limited to furnace temperatures corresponding to the melting temperature of flue dust and also the melting temperatures of ash. The gases arriving at the boiler tubes must not exceed these temperatures, neither must the temperature of ash and dust on floor be higher. As previously stated,

Theoretical Temperature of Gases in Boiler Furnaces



NOTE:—In practice, deduct for 45% humidity 100°C-180°F. Also furnace radiation 50°C-90°F. Total deductions, high temp. furnaces 150°C-270°F. Boilers and other furnaces 100°C-180°F.

Fig. 3. Theoretical Temperature of Gases in Boiler Furnaces at Different Ratings and Percentages of CO_2 .

furnace temperatures are controlled by the amount of direct heating surface exposed to the fire.

The curves in Figs. 1, 2 and 3 are theoretically correct, the amount of heat absorbed being that found in practice. This has been taken at a constant, to arrive at the various considerations. Fig. 3 shows the temperature in coal-fired boiler furnaces; Fig. 2 shows theoretical temperature in blast furnace gas-fired boiler furnaces; Fig. 1 is based on the Stefan-Boltzmann law, with a proper constant for practical calculation of heat transfer from furnace to direct boiler heating surface.

It should be remembered that the steam capacity of any coal-fired boiler is no greater than the relative amount of direct heating surface exposed to the fire. Also, there is a tendency for ash and dust to accumulate on the floor of the furnace, which cannot be removed unless the floor is water cooled, preferably by a cast iron covered floor.

High Cost of Workmen's Compensation

New York employers spend more money on workmen's compensation, per worker insured, than do employers of any other State, according to a report by the National Industrial Conference Board. This is in part due to more liberal benefits granted in New York, and partly to higher wage levels. For every dollar spent on compensation per worker in New York in 1926, employers in other States spent from 32c. in the lowest to 76c. in the highest case. Compensation insurance rates for workers in all occupations have increased on the average 48 per cent since 1914. But the total cost of compensation for insured employers, excluding the self-insured, has risen in New York State from about \$12,000,000 in 1914 to about \$55,000,000 in 1925.

Changes in the cost of compensation in different lines of occupations have varied greatly during the past decade. In a large group of industries, including, among others, the metal trades and iron and steel, the average cost of compensation per wage earner in New York is found to have increased 320 per cent since 1914. The average wage cost in these industries increased 120 per cent during the same period. Total cost of compensation, per \$100 of payroll, is 190 per cent higher in New York than in Pennsylvania, and is about double the cost in New Jersey and nearly double that in Connecticut and Massachusetts.

In the foundry and machine shop industry, compensation per worker now costs over four times what it did in 1914, largely because of increased benefits and larger payrolls. In the iron and steel erection industry, the average cost of compensation per \$100 of

payroll has risen from \$13.77 to \$27.45, or nearly double, between 1914 and 1926.

Wages in Industry Continue High

The National Industrial Conference Board, 247 Park Avenue, New York, reports that composite wage data for the manufacturing industry as a whole, covering some 2000 plants in 25 different industries, show that while employment and the total number of hours worked began to decline in October, employment in November, 1926, was still greater than in November, 1925, while total hours worked were only about 2 per cent less than in November, 1925. The significant fact, however, according to the board's analysis, is that workers in the manufacturing industries in November, 1926, on the average were receiving higher hourly (and practically as high weekly) earnings than they had at any time during the past two years. Their average weekly "real" earnings, that is, their wages measured by their purchasing power, were higher in October, 1926, than they had been at any time since the beginning of 1924, and were higher in November, 1926, than they had been in November, 1925. This, in view of the fact that there had been two full years of high industrial activity at high wage levels, the board declares, is the best index of the actual present consumption power of the working population, which constitutes the greatest market factor.

"Low-Temperature Carbonization of Coal" is the title of technical paper 396 of the United States Bureau of Mines. The author is A. C. Fieldner.

Copper Hardened by New Method*

What the Corson Alloys Are—Stronger Cable Wire
Possible—Many Uses Suggested—Silicon-
Aluminum and Silver-Silicon Alloys

BY M. G. CORSON

BESIDES the high copper-silicon alloys there has recently been discovered a group of four series of ternary alloys, known as Corson alloys, each containing relatively small amounts of silicon in addition to much larger amounts of chromium, iron, cobalt or nickel. The proportions of the latter metals are so calculated as to form silicides of the formulae, Ni_2Si , Cr_3Si , Co_3Si and probably Fe_3Si (a). The amount of copper present in these alloys varies from a minimum of 91 per cent for the high nickel alloys to 99.4 per cent maximum for the copper-chromium silicon alloys.

All four series form a natural class of alloys, which

*This article supplements the one, "Merit in Copper-Silicon Alloys," published in THE IRON AGE, Feb. 2. The author is consulting metallurgist, 8108 Polk Avenue, Jackson Heights, N. Y. Published by permission of the Electro Metallurgical Co., New York.

(a) The compound Fe_3Si is considered non-existent; it may, however, become possible when crystallizing from molten or solid copper.

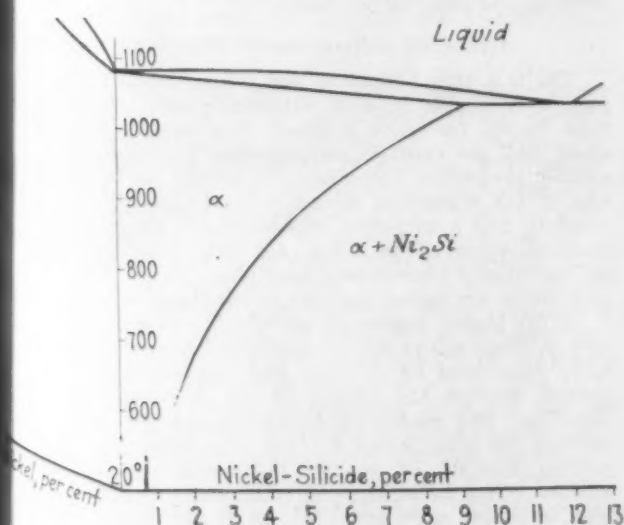


Fig. 10

Fig. 10—Tentative Constitutional Diagram of the $\text{Cu} = \text{Ni}_2\text{Si}$ Alloys as Developed by the Author.

Fig. 12—Hardening Effects in the $\text{Cu} = \text{Ni}_2\text{Si}$ Alloy System.

ABCD, Brinell hardness as rolled and quenched from 950 deg.

ABEC, Brinell hardness as drawn $\frac{1}{2}$ hr. at 500 deg. and slowly cooled.

ABDD, Brinell hardness as quenched in oil.

ED, excessive hardening which happens sometimes, due to faulty quenching.

AGF, electric resistivity as rolled and quenched from 950 deg.

AGH, same, as drawn at 500 deg. and slowly cooled down to 350 deg.

Fig. 13—Influence of the Time of Drawing at 550 Deg. Upon the Hardness and Electric Resistivity of an Alloy with 8 Per Cent Ni_2Si . ABC = Hardness; DE = Resistivity

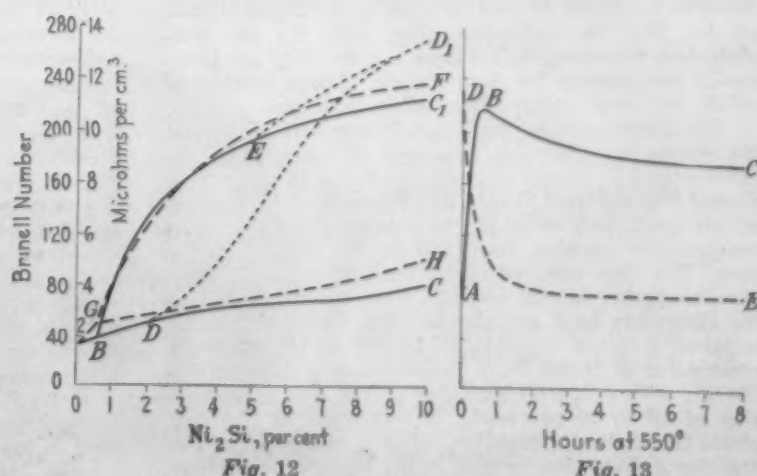


Fig. 12

Fig. 13

are amenable to heat treatment in a way that makes them appear to be a counterpart of duralumin. They form pseudo-binary systems, with copper as one component and a definite silicide, Ni_2Si , Co_3Si or Cr_3Si as the second one.

The direction of the boundary between the pure alpha alloys and those of a duplex structure (in the constitutional diagram) is such that it is certain that there is an increased solid solubility of the silicide in copper at higher temperatures. Nickel silicide is the most soluble, as much as 7.3 per cent nickel and 1.7 per cent silicon being retained by copper in solid solution at a temperature of 980 deg. C. At room temperature the solubility is very low; at any rate it does not exceed 0.7 per cent nickel and 0.15 per cent silicon. Quenching retains the alpha state of the alloys at low temperatures, while slow cooling causes all excess silicide present to crystallize as a second phase. Figs. 11 and 12 illustrate the constitutional aspects of the $\text{Cu}-\text{Ni}_2\text{Si}$ and the $\text{Cu}-\text{Co}_3\text{Si}$ series.

In a chill-cast bar of an alloy containing, for instance, 4 per cent nickel or 2 per cent cobalt or 0.5 per cent chromium, plus a corresponding amount of silicon, the silicide is present in three forms. One part of it is retained by copper in solid solution, due to quick cooling. This part decreases the electrical conductivity and changes but little the mechanical properties of the alloy. Another part (and quite a large one) is found precipitated in the form of microscopically visible crystals at the boundaries of the grains of the ground mass. This part has little influence upon the electrical conductivity or the hardness of the alloys; it impairs, however, their workability under pressure or pull.

Finally, a third part is found precipitated in the ultra-microscopical form. This part does not affect the electrical conductivity; it produces, however, a state of a high hardness and considerable strength. The composition mentioned (4 per cent $\text{Ni} + 1.9$ per cent Si) shows, when chill cast, a Brinell hardness of 175 to 190 and a strength of 75,000 lb. with 5 per cent elongation. An alloy containing 0.5 per cent chromium shows a hardness of 90 and a strength of 40,000 lb. per sq. in. The electrical resistivities are 10.5 and 3.7 microhms respectively.

At a temperature of 750 to 900 deg. the structure and properties of the cast alloy change quickly. Either a part or the whole of the silicide goes into solid solution (according to the temperature of the treatment)

and the remaining grainlets diminish in size and coalesce into globules.

The cast metal changed in this way by a high temperature treatment is made soft enough for cold work either by quenching or by slow cooling in the furnace. However, it is more advantageous to begin by hot working. Alloys containing about 7 per cent nickel are suitable only for hot forging; those containing 5 per cent nickel may be hot forged first and hot rolled afterward, while those containing about 3 per cent nickel can be hot rolled immediately and given very heavy reductions per pass.

At a certain stage before the final shape and size

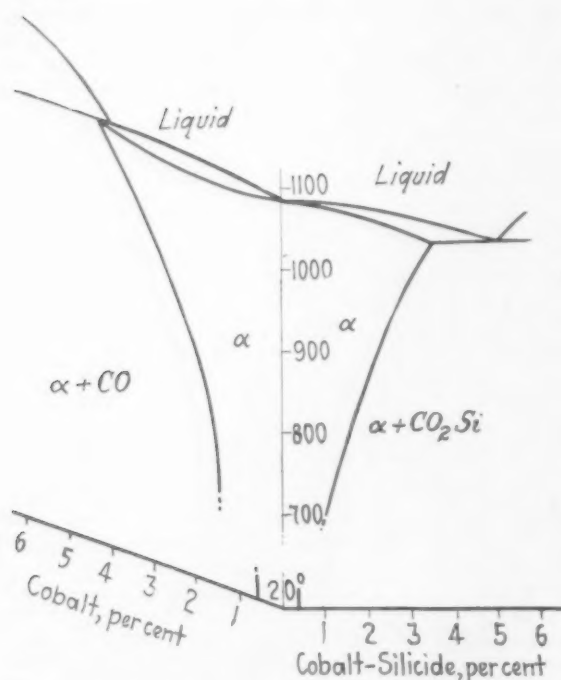


Fig. 11—Tentative Constitutional Diagrams of Copper-Cobalt and Copper Co₂Si Alloys as Developed by the Author

are reached, the semifinished product is treated at a temperature of 750-950 deg., according to the nature of the alloy and the amount of silicide present. An alloy with 3 per cent nickel requires not more than 830 deg. to be almost completely homogenized. At 900 deg. its grains become too large and unreliable. Alloys much higher in nickel or those containing about 1.2 per cent cobalt must be treated at 900 deg., while those containing larger amounts of cobalt (about 2 per cent), or containing chromium, are treated preferably at 950 deg. The duration of the heat treatment need not be long, one-half to one hour being sufficient.

In the quenched state all four types of alloys are very soft and show at least 50 per cent, in some cases even 70 per cent, elongation in 2 in. The strength of the quenched nickel alloy (with 4 per cent nickel) was found to be 60,000 lb. and its yield point 20,000 lb. per sq. in. For the chromium alloy with 0.5 per cent chromium the strength, hardness and ductility are practically the same as for pure copper. Alloys containing cobalt and iron occupy intermediate positions.

The alloys can be marketed in the soft state and the sheets may be spun into cups or stamped to the same extent as copper or cartridge brass in short, fabricated into different shapes by cold work. The finished article needs only to be put in a furnace and kept at a temperature ranging from 350 to 550 deg. C. for a time. The time required varies from 30 hr. in the first case to ½ hr. in the second. This treatment makes the alloy very hard and strong. The nickel alloys, for instance, attain a strength of 110,000 to 115,000 lb., a yield point of 75,000 lb., a proportionality limit of 50,000 lb., with a Brinell hardness of 180 and an elongation of 10 to 18 per cent. A treatment at 350 deg. yields the highest elongation, while a treatment at 550 deg. for a short time results in the highest proportion-

ality limit. The heat treatment worked out for the finished article applies fully to the product of the rolling mill (rods, sheets, wire, tubing) either immediately after being softened by quenching or after being subjected to further cold work in between.

A particular feature of this second heat treatment is its influence upon the electrical resistivity. The latter decreases enormously. A chromium alloy will show about 2.2 microhms per cm' in the hard state (against 3.7 in the soft one) and the copper-nickel-silicon alloy shows 3.2 microhms against 10.5. Figs. 13 and 14 reproduce the hardness and electrical conductivity of the Cu-Ni-Si series, while Figs. 15 to 18 show the microstructures of these alloys.

The group of four series of alloys described will probably find a large application in various fields of industry. All these alloys can be manufactured in the form of high conductivity and high strength wire, to be used in the construction of telephone lines, cables, trolley lines, etc. In the spun or stamped form they will be found useful in chemical industries as thin walled kettles, tanks, etc. They can be made to withstand high pressure or vacuum without an external reinforcement by steel. Roof shingles now made of plain copper can be made of copper-nickel-silicon alloy sheet with a saving of 30 to 40 per cent in thickness while their strength, wear resistance and stiffness will be greatly enhanced. The alloys containing nickel or cobalt (plus silicon) possess a tendency to become covered in time with a lustrous and uniform brown patina, while plain copper shows only an uneven covering of a dirty-green. All the alloys described can be used to obtain tubing and pipe by the Mannesmann or other piercing and cupping processes.

Alloys of Silicon with Aluminum

The fact that aluminum and silicon present a comparatively simple case of eutectic-forming alloys has been known for quite a time. The eutectic alloy of about 10.5 per cent silicon possesses a number of desirable properties including the lowest shrinkage of any of the aluminum alloys, a good strength, a fair ductility and a corrosion resistance far above that of most aluminum alloys in the cast state. Castings made of the eutectic aluminum-silicon alloy, called "Silumin" in Europe, are suited for use in the chemical industry.

A far higher degree of usefulness and reliability is lent to these alloys by the modification process, originally discovered by A. Pacz and afterward much improved through the efforts of the Aluminum Co. of America. The modifying treatment consists either in melting the alloy under a cover of a small amount of sodium fluoride or in the introduction of metallic sodium. This latter method (Aluminum Co. of America) is much more practical, as it requires a lower temperature and the castings are usually sounder.

The modification process probably is quite complicated as to its chemical and physical nature, at least no fully satisfactory explanation has so far been offered. This has not prevented the development of a definite practice which results in good and reliably strong castings as a matter of routine. Metallic sodium, 0.1-0.2 per cent, is introduced into the molten alloy at 650-700 deg. C. and the melt kept untouched for 20 min. before it is poured. These 20 min. probably suffice to complete the process of modification and allow all excess sodium to burn away. When cast, either in sand or chills, the modified alloy has a very fine texture and the individual particles of silicon are hardly discernible at a magnification of 500 diameters. Its strength was up to 30,000 lb. and the elongation to 7 per cent against 22,000 lb. and 3 per cent in the non-modified alloy.

All alloys up to 15 per cent silicon may be used for castings in the modified state. The best composition lies, however, at 13.8 per cent silicon where a strictly eutectic structure is obtained and both aluminum and silicon are dispersed to the possible limit. They are fairly workable hot up to 15 per cent silicon and cold to about 5 per cent. The wrought alloys show no distinctive improvement in comparison with other aluminum alloys.

The fine properties of aluminum-silicon alloys gave



Fig. 14 (Left)—A 4-Per Cent Ni_3Si ; Copper Alloy as Chill Cast; X 70

Fig. 15 (Right)—A 10-Per Cent Ni_3Si ; Copper Alloy as Chill Cast; X 350

an impulse to the investigation of a few ternary systems within the ranges where aluminum forms the bulk of the alloy and silicon is the predominating addition. Dix has shown for instance that it is possible to obtain good castings of aluminum-silicon-copper while others obtained aluminum-silicon-zinc alloys with a somewhat better strength and considerably higher yield point than obtainable in the non-modified silumin.

Compositions of this kind are now in a regular use for the manufacture of certain parts of airplane engines, crank-cases and also cast parts of the airplane structure. One has to bear in mind, of course, that the presence of either copper or zinc does not enhance the corrosion resistance of the alloy. Thus a casting designed to serve in a chemical industry must be made of the purest (iron free) binary alloy only. The sodium treatment may be just as successfully applied to the ternary as to the binary alloys.

The most successful combination of physical and chemical properties of all aluminum-silicon alloys either in the normal or the modified state depends largely on the purity of the alloyed elements. Not over 0.6 per cent iron should be allowed in the aluminum used for alloying and aluminum containing even less iron should be accepted in spite of its higher price for any casting intended to withstand corrosion or to be in contact with compressed gases and vapors.

Smaller amounts of silicon (up to 2 per cent) are used in the "Lautal" type of alloys, which represent a cheaper grade of duralumin developed in Germany and used with a slight modification in the United States as well (alloy No. 25S). In this case silicon acts as a grain growth inhibitor while copper takes the part of the actual hardening element. The alloys acquire their high mechanical properties after a double heat treatment, the first at about 510 deg. for $\frac{1}{2}$ to 1 hr. followed by quenching, the second at 100 to 160 deg. for 20 to 10 hr.

Silicon in small amounts (below 1.0 per cent) is purposely introduced into an aluminum alloy of a high strength and high aluminum content, namely the European "Aludur" and the American "51S." It is accompanied in this case by larger amounts of magnesium. The latter forms with silicon a compound, Mg_2Si , which acts exactly like the Ni_3Si or Co_3Si in the case of the copper alloys already described recently de-

veloped by the author. Alloys of this type always contain above 98 per cent aluminum and their properties are developed by a double heat treatment. Their strength is about 12,000 lb. per sq. in. lower, while the hardness and elongation differ but slightly from those normal for the regular duralumin compositions. The absence of copper leads, however, to an elimination of accelerated corrosion, and alloys of this type are second in their chemical stability only to the best aluminum metal and to the hard aluminum of the trade (as hardened by about 1.2 per cent manganese).

Silver-Silicon Alloys

The binary series silver-silicon represent a case strictly analogous to that of aluminum-silicon. At nearly 4 per cent by weight, or 13 per cent atomic, the series forms a eutectic which cannot be told from the aluminum-silicon eutectic under the microscope. This eutectic alloy may be hot and cold worked to a considerable degree and when of that desirable composition, where neither patches of the primarily crystallized silver nor primary crystals of silicon mar to any extent the eutectic structure, the alloy acquires a remarkable ability to withstand tarnishing in air containing either sulphur or ozone. An addition of cadmium, tin or zinc (the first is preferable from the viewpoint of workability) permits bringing the alloy to the sterling (92.5 per cent Ag.) composition and opens a way to the manufacture of tarnish resisting silver articles.

A drawback to this silver-silicon-cadmium sterling alloy lies in the difficulty of polishing which arises as soon as a few tiny crystals of silicon happen to crystallize primarily. Quite possibly some way of modifying the alloy so as to refine the eutectic and exclude the formation of segregated crystals of silicon will be found in the near future, and the only practical objection to the use of the mentioned alloy for silverware manufacture will be eliminated.

A small amount of silicon, probably not exceeding 0.2 per cent is soluble in solid silver at higher temperature, but precipitates on annealing. Its precipitation, if accomplished at a low temperature (200 deg. C.) leads to a hardening effect of 15 Brinell units (from 56 to 70 at 500 kg. and 10-mm. ball). The hardening effect becomes much stronger when copper is present

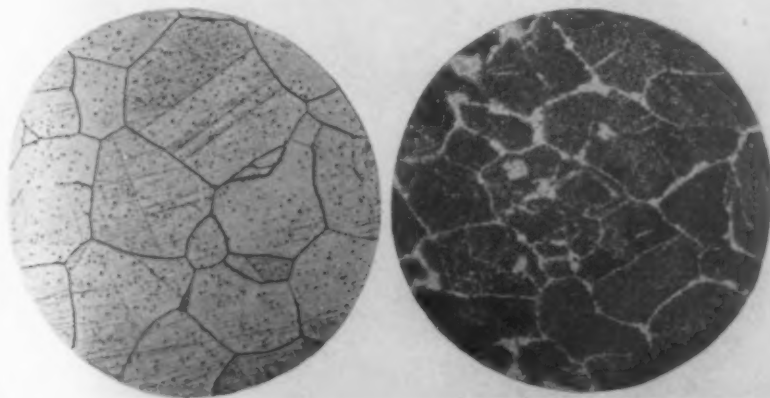
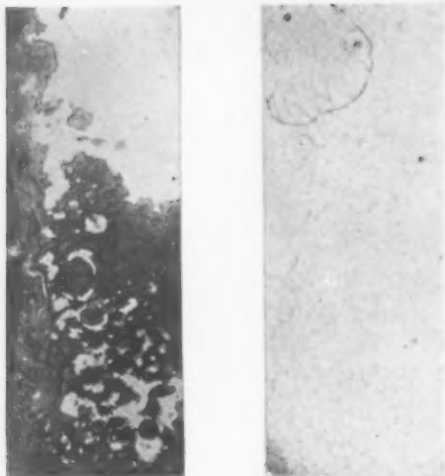


Fig. 16 (Left)—A 6-Per Cent Ni_3Si ; Alloy as Hot Rolled and Quenched from 930 Deg.; X 70

Fig. 17 (Right)—Same Alloy as Drawn for 6 Hr. at 800 Deg.; Furnace Cooled; X 70



Figs. 18 and 19—Comparative Tarnishing Under the Action of Sulphur Carrying Steam in a 7.5 Per Cent Cd Sterling Silver and in a 3.5 Per Cent Cd + 4 Per Cent Silicon-Silver Alloy

in an amount sufficient to turn this 0.2 per cent silicon into the compound Cu_3Si (1.5 per cent copper). In this way a silver alloy with over 98 per cent silver is obtained, which (in the rolled state) after a quenching

from 800 deg. and a drawing of 200 deg. develops a Brinell hardness of 100 and shows a considerable increase in strength (a).

Effects of Silicon in Gold Alloys

An effect analogous to that produced in copper alloys by Ni_3Si , Co_3Si , Cr_3Si , in aluminum alloys by Mg_2Si and in silver alloys by Cu_3Si is obtained in gold alloys, if the latter contain about 0.15 per cent silicon in addition to suitable amounts of either nickel, manganese, cobalt, chromium, copper or palladium (b). All these metals form silicides when encountering the silicon in the melt, while gold forms no silicides whatever. At high temperatures gold becomes capable of forcing a dissociation of the silicides and of taking both the silicon and the third metal into solid solution. Gold alloys containing not over 1 per cent of the silicide can be hot rolled with ease, and afterwards cold rolled to a large extent. A process of heat treatment consisting of nearly the same operations as used on Corson alloys brings the alloy to a state of high hardness (Brinell hardness of 160 to 220 1/16-in. ball, 12-kg. load).

The author desires to acknowledge the cooperation of J. R. Villela of the Union Carbide & Carbon Research Laboratories, Inc., Long Island City, N. Y., who prepared the photomicrographs, using his own reagent for etching, chromic and hydrochloric acid.

(a) Discovered by the author.

(b) Discovered by the author, patents pending.

INDUSTRIAL HEATING

New Developments in 1926—Immersion Type Electric Heating Units Applied

A new application of the immersion type of electric heating unit brought out by the General Electric Co. in 1926, consisted of utilizing it in existing standard fuel-fired types of the stereotype pots or furnaces used in printing plants. The heating units are located on the inside of the pot and the heat is delivered to the metal for the depth of the entire charge, thereby producing heat for surface melting, so that no undue strains, tending to crack the crucible, will be set up in the stereotype metal. Automatic heat control is utilized.

Pots of this type in capacities up to 6 tons were equipped for operating at a maximum temperature of 650 deg. Fahr., with a current consumption of 150 kw.

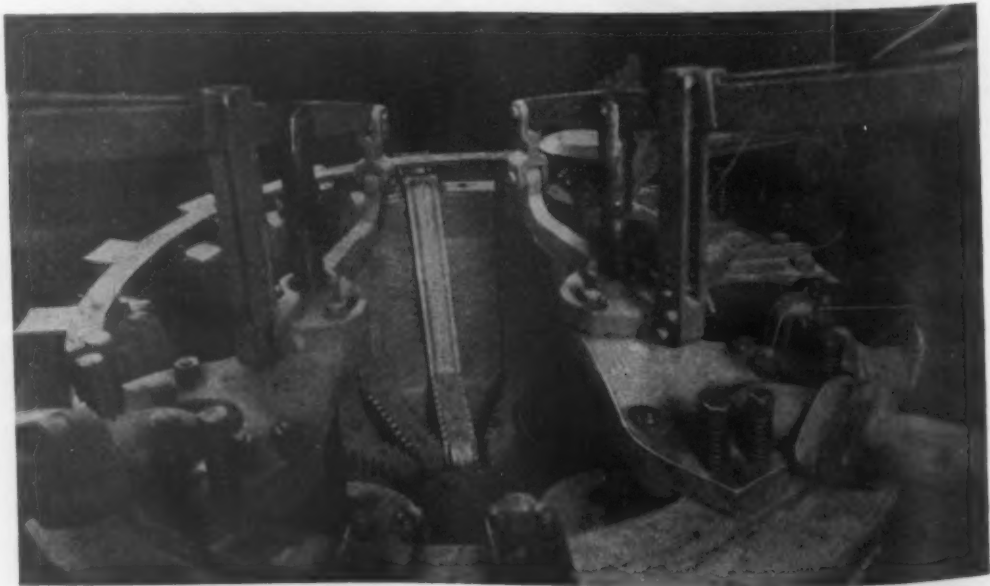
Caustic soda fusing on a commercial scale was accomplished for the first time in 1926 by electric heat. This work is done in kettles 10 ft. in diameter, each holding about 30 tons of caustic. The connected load

for each kettle is 500 kw., and the heating units are mounted outside the kettle and are automatically controlled. Low temperatures are utilized in starting the operation, the temperature being increased gradually to a maximum of 600 deg. Fahr.

Automobile Body Plant Left with Heavy Inventory

In explaining to stockholders the passing of the quarterly dividend of 50c. a share, Edward G. Budd, president Edward G. Budd Mfg. Co., Philadelphia, one of the largest automobile body building plants in the United States, said that the slowing down of automobile business the last half of 1926 left the company with an excessive inventory, now approximately \$5,000,000 greater than it was a year ago. Mr. Budd said it would be several months before this inventory will be worked down to what is regarded as normal. The company is reported to have closed a \$3,000,000 contract for steel bodies with a large automobile manufacturer and deliveries will begin May 1.

Interior of 5-Ton
Stereotype Metal
Melting Pot
Equipped with
Nine Electric
Immersion Units,
Each of 5 Kw. at
220 Volts. The
operating tem-
perature is 650
deg. Fahr.



Dry Quenching of By-Product Coke

Economic Advantages Include Heat Recovery, Reduced Equipment Maintenance Charges and More and Better Coke for Sale

BY SIDNEY G. KOON

THREE main objects are behind the search for satisfactory means of quenching coke without spraying it with water. Primarily, the recovery of the heat dissipated in water quenching is the object sought. As a secondary consideration, it is desired to avoid the upkeep and maintenance expense incident to the discharge of much moisture into the air in the neighborhood of operating machinery. Then there is the question of the improvement in coke quality.

This problem has been attacked from several different angles. As water is the most satisfactory means for recovery of heat, the solutions have involved boilers in which the contained water can be converted into steam. Methods of handling the operations, however, have differed with different designs. One such method is detailed in the following paragraphs.

Closed Circuit of Inert Gases

Circulation of so-called "inert gases" through a large mass of coke in varying stages of quenching is the design adopted by Sulzer Frères, Winterthur, Switzerland. An installation of this type, in the West Station of the Rochester (N. Y.) Gas & Electric Corporation, under the engineering supervision of J. G. White Engineering Corporation, New York, is reported to be proving itself a satisfactory investment. Alex-

ander M. Beebee, of the Rochester company, is in direct charge of the plant.

In this design a coke container, with a capacity of about 40 tons, is associated with a double-drum firetube boiler, a dust catcher and a motor-driven fan. These units are provided in duplicate. Auxiliaries include a vertical skip hoist and an interlocking filling chute, which serve the two units. The general arrangement of the device is shown in Fig. 1.

Coke direct from the by-product ovens is brought in the coke car to the foot of the skip hoist, where the

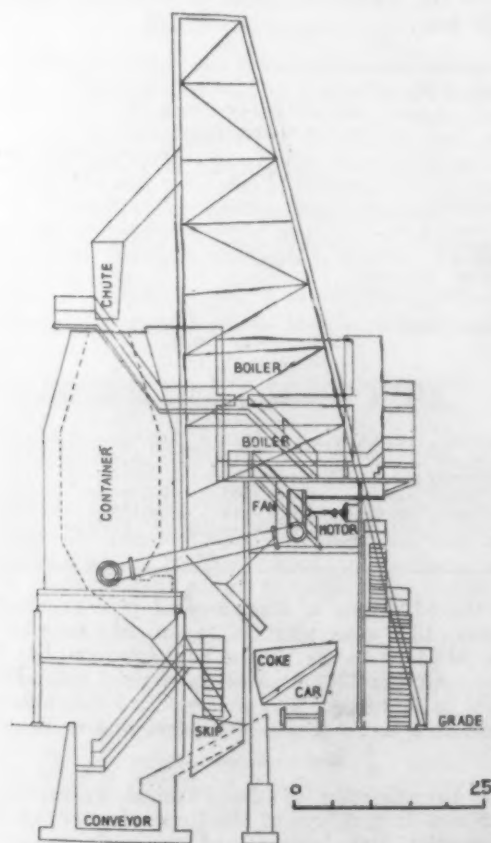


Fig. 1—Side Elevation of Sulzer Dry-Quenching Plant at Rochester. Containers, boilers, fans and motors are in duplicate

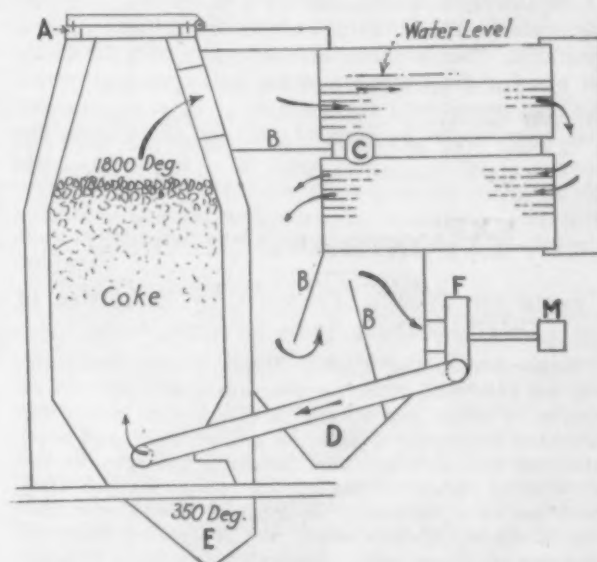


Fig. 2—Section Through Main Elements of the Dry-Quenching Unit, Showing by Arrows the Closed Circulation of Inert Gases. Coke at 1800 deg. is cooled to 350 deg. before withdrawal, the dissipated heat being used in the double boiler to evaporate water into steam. In the diagram, A is the water seal at coke entrance; B, baffles; C, boiler cross connection; D, dust catcher; E, coke removal; F, the fan, and M, its motor

charge, consisting of about $4\frac{1}{2}$ net tons, is delivered into the skip. The vertical hoist of about 70 ft. places the coke opposite an automatically controlled chute above the containers. Here it is dumped, via the chute, into the top of a container, in a few seconds. Just before this charge is put into the container, an equal amount is withdrawn from the bottom, where it goes to a conveyor and is landed on the wharf.

Entering coke has a temperature of about 1800 deg. Fahr., while on leaving the quencher it is at about 350 deg. As the two containers are given the alternate charges, and as coke is pushed every 12 min., each container receives a fresh charge every 24 min. Some nine or ten such charges represent the container capacity; hence the coke is in the container approximately 4 hr.

Method of Circulating Gases

Essential to the system is the method of circulating the inert gases, which are reported to contain less than $\frac{1}{2}$ per cent of oxygen. As shown by the arrows in

Fig. 2, the hot gas off the top of the contained coke goes into the upper boiler drum, passing through the tubes and through the rear-end connection down to the lower drum, where it again passes through a group of tubes. From the lower drum it goes into the dust catcher, which contains baffles to slow the flow and wipe the dust out of the gas. Thence it goes through the actuating fan, driven by motor, and is forced back into the bottom of the container.

This continuous circulation in a closed circuit results in rapid transfer of heat to the water in the boilers. About 400 lb. of water is evaporated for each 1000 lb. of coke passed through. This result is considerably better than the guarantee of the makers, which was 370 lb. and based upon coke at 2100 deg. With the plant still in the experimental stage, it is undergoing continual test in an endeavor to learn just what can be expected of it in regular practice.

Many Safeguards Employed

Water seals at top are provided. Limit switches and other interconnecting electrical devices are utilized as safeguards, so that the top cover is always closed when the skip hoist is not at the top.

On the top platform, the lower end of the distributing chute for filling the two containers is mounted on a turntable. This is connected electrically with the device for opening the water-sealed top doors, through which the coke passes into the container. It is so arranged that coke cannot be dumped into the chute from the

skip until the door is fully open and the chute properly in position. Another safeguard consists of a water-sealed hood, acting in the manner of a safety valve, to relieve container pressure in case of accidental influx of air or other formation of an explosive mixture.

General Conditions

Situated as the Rochester plant is, on the flat of the Genesee River, nearly 100 ft. below the top of the bank, the question of escaping steam into the air became important. Coal is delivered to the plant from the upper level by means of long lines of conveyors, the maintenance of which is a serious problem in winter, if there is much moisture in the air. This consideration, together with relations with adjoining property owners, was joined to the direct economic question of making use of the heat otherwise wasted in quenching the coke. Altogether, in spite of the initial mechanical troubles incident to the operation of anything new, the plant is proving itself in a satisfactory manner.

No metallurgical coke is made at the Rochester plant. The market for domestic sizes takes the entire output. It has been found that the coke produced by dry quenching is superior in several particulars to that obtained through wet quenching. It has a greater uniformity, both in color and in average size of lump. It has greater strength to withstand handling without breaking up; it can be dumped several times, with less breakage.

EXPORTS AND IMPORTS

Figures for Specific Products by Countries of Origin—Where Some Exports Went

Imports into the United States during December and the full year 1926, as well as figures for the 12 months of 1925, are shown in the tables below, for structural steel, steel bars, cast iron pipe and steel rails. It will be noted that Belgium has sent us approximately three-fourths of all the structural steel which we have imported. Belgium is in the lead likewise in supplying steel bars, her proportion being of the order of 60 per cent. Belgium again leads in shipments of steel rails, having sent us three-fourths of the total in 1925, but only two-fifths of the total in 1926, in which year the German tonnage was a close second.

When it comes to cast iron pipe, France supplied more than two-thirds of the total, both in December and in the calendar year. A still larger proportion came from France in 1925, with more than 80 per cent of the total. Belgium was in second position in each of the three periods covered, having supplied almost one-third of the December total, more than one-fourth for the year and more than one-eighth of the total for 1925.

United States Imports of Structural Steel by Chief Countries of Origin

	(In Gross Tons)		
	December 1926	12 months ended December 1926	12 months ended December 1925
Totals	10,454	121,099	77,293
Belgium	7,921	85,177	63,342
Germany	1,880	21,577	3,137
France	449	7,828	4,552

United States Imports of Steel Bars by Chief Countries of Origin

	(In Gross Tons)		
	December 1926	12 months ended December 1926	12 months ended December 1925
Totals	6,324	104,580	58,811
Belgium	3,439	56,494	37,255
Germany	1,106	15,842	3,110
France	729	12,841	5,992

The British coal strike undoubtedly explains some of the comparatively heavier movements of finished steel products into the United Kingdom. Two particular examples concern steel bars and tin plate. Exports of American steel bars to the United Kingdom in December amounted to 3423 tons, while for the year 1926 the total was 27,396 tons. Exports of American tin plate to the United Kingdom in December amounted to 1698 tons.

United States Imports of Cast Iron Pipe by Leading Countries of Origin

	(In Gross Tons)		
	December 1926	Twelve Months Ended December, 1926	Twelve Months Ended December, 1925
Totals	12,094	83,875	51,215
France	8,209	57,072	42,444
Belgium	3,863	22,248	6,874
Canada .....	...	697	1,717
United Kingdom .....	...	38	...
All other countries....	22	3,817	180

United States Imports of Steel Rails by Leading Countries of Origin

	(In Gross Tons)		
	December 1926	Twelve Months Ended December, 1926	Twelve Months Ended December, 1925
Totals	982	62,776	36,871
Belgium	759	25,826	27,287
France .....	...	1,418	347
Germany	205	23,069	4,281
Netherlands .....	...	3,144	1,871
United Kingdom .....	...	49	794
All other countries....	18	9,270	2,291

Of the 6374 tons of black welded pipe exported in December, 1373 tons went to Japan, 967 tons to Colombia, 949 tons to the United Kingdom, and 544 tons to Peru. Of the 6271 tons of galvanized welded pipe exported in December, 2251 tons went to Colombia and 456 tons each to the United Kingdom and to Belgium.

"An Investigation of the Physical Properties of Some Nickel-Iron Alloys of the Invar Group," by Eric A. Blomquist, has been issued as engineering and science series No. 13, by the Rensselaer Polytechnic Institute, Troy, N. Y. With seven charts the text covers 14 pages, and discusses the history, scope, production of the alloys, tests, etc.

MANGANESE IN 1926

Decline in Domestic High-Grade Ore Output —Heavy Ore Imports and Ferro- manganese Output

Domestic shipments of manganese ore containing 35 per cent and more of metallic manganese totaled in 1926 approximately 44,000 gross tons, valued at \$1,185,600, according to preliminary figures compiled by the United States Bureau of Mines. This is a decrease of 55 per cent from the 1925 shipments, amounting to 98,324 tons. The increase in average value per ton of all ore shipped in 1926 is due to the fact that the ratio of the shipments of chemical ore to those of metallurgical ore greatly increased. The shipments of metallurgical ore amounted to 24,200 tons, valued at \$332,000, while those of 1925 were 76,173 tons, valued at \$954,799. The shipments of chemical ore in 1926 amounted to 19,800 tons, valued at \$853,600, while those of 1925 were 22,151 tons, valued at \$902,970.

In 1925 the Butte, Mont., district shipped 47,507 tons of manganese ore and in 1926 this district shipped only 1718 tons. The decrease indicated is due to the fact that in 1925 the Emma mine shipped 47,469 tons and in 1926, 1718 tons. In July, 1926, shipments from the Crescent mine, Wash., were discontinued. The ore was bottomed at a vertical distance of 400 ft. and the continuation of the ore-body was not found by diamond drilling. No high-grade ore was produced during the year from Leadville, Colo. Shipments of manganese ore from Arizona and Georgia showed increases over 1925. The production from the Batesville-Cushman district, Ark., in 1926 showed a decided decrease from 1925, and must be attributed in part to the exhaustion of the ores minable at prevailing prices.

The quoted price of high-grade manganese ore during the year has been relatively constant. A material tonnage has been sold at a figure far below those quoted; the average price for the year was approximately 40c. a unit, c.i.f. Atlantic seaboard.

Heavy Ore Imports

Figures furnished by the Bureau of Foreign and Domestic Commerce show that during the first 11 months of 1926 the metallic manganese content of manganese ore imported amounted to 327,258 tons, exclusive of imports from Cuba. The imports from Cuba for 11 months are given as 13,937 tons of manganese ore. For the first 11 months, the manganese content of ferromanganese imported is given as 36,471 tons. Assuming an average manganese content of 48 per

cent for all ores imported, the gross weight of the ore imported, including that of Cuba, during this period was approximately 703,000 tons. Assuming the imports of December to be equivalent to those of November, the total for the year would be about 745,000 tons, as compared with 615,000 tons in 1925, an increase of 130,000 tons.

This large increase may be accounted for by the decrease in imports of ferromanganese and by the increase of stocks in this country. A portion of this increase during 1926 was in part due to the increase in the production of steel.

The metallic manganese in the imports of ore from Russia amounted to 126,201 tons, or on a 50 per cent basis, 252,400 tons of ore, for the first 11 months of 1926, as compared with 114,537 tons for all of 1925. The exports from the Tchiatouri deposits to the United States amounted to 177,295 tons of ore for the first 10 months of 1926. The metallic manganese in the imports from Brazil for the first 11 months of 1926 amounted to 125,202 tons, compared with 109,650 tons for all of 1925. Imports in terms of manganese content from British India will show an increase for 1926, being 25,689 tons imported for the first 11 months as compared with 23,504 tons for all of 1925. Imports from the Gold Coast of West Africa for the first 11 months were 41,683 tons, compared with 31,750 tons for all of 1925.

Low-Grade Ores From Domestic Mines

The shipments of domestic ores containing from 10 to 35 per cent manganese increased in 1926 from 267,252 tons, valued at \$915,316 to approximately 366,500 tons, valued at \$1,119,000. This increase is due to the large increase in production in Minnesota and New Mexico, whereas production in Colorado and Georgia decreased.

Domestic shipments of ore containing 5 to 10 per cent manganese show a decided decrease from those of 1925. This decrease is due to the fact that the 347,639 tons of ore which the Ottawa mine in Wisconsin produced contained only 4.8 per cent manganese in the natural state. This percentage falls slightly below the classification, but the ore was consumed as mangiferous iron ore by the trade. Shipments from Minnesota increased from 741,409 tons in 1925 to 810,769 tons in 1926, and those from Wisconsin decreased from 404,014 tons containing over 5 per cent manganese to 347,639 tons containing 4.8 per cent.

The apparent outstanding feature of the year has been the increase in the domestic manufacture of ferromanganese. During the year the Bethlehem Steel Corporation placed ferromanganese on the market. This action resulted in a decrease in price from \$115 to \$88.

MORE CAST IRON PIPE

Bell-and-Spigot Production in 1925 Was 26 Per Cent Above 1923

Cast iron pipe and other products, to a total value of \$100,387,885, were turned out in 1925 by 77 establishments engaged in that work, according to the United States Bureau of the Census. This is a gain of

8.3 per cent from the \$92,674,088 of 1923, from 73 establishments. Wage earners increased from 21,576 to 23,033 and the payrolls from \$25,019,953 to \$27,438,033. The principal qualities of pipe produced in the two years, with corresponding values, are given in the table.

Bell and spigot pipe tonnage produced in 1925 was 26 per cent greater than in 1923, while the value advanced only 16½ per cent. The reported average value per net ton was \$45.20 in 1925, against \$48.90 in 1923.

Cast Iron Pipe and Fittings, by Kind, Quantity, and Value; 1925 and 1923

	1925		1923	
	Net Tons	Value	Net Tons	Value
Gas and water pipe and fittings:				
Bell and spigot pipe.....	1,292,879	\$58,433,580	1,025,130	\$50,121,361
Flanged pipe	45,699	2,544,824	(a)	(a)
Culvert pipe	9,363	562,099	7,487	393,929
Fittings	88,624	9,650,744	92,267	12,398,764
Soil and plumbers' pipe and fittings.....	469,557	23,579,283	(b) 440,548	(b) 25,035,029
All other products.....	.....	5,616,355	.....	4,724,995

(a) Included with "Soil and plumbers' pipe and fittings."

(b) Includes gas and water "Flanged pipe."

NATIONAL EMPLOYMENT INDEX

Proposed in Plan to Standardize and Extend Collection of Employment Statistics

The study of business trends is now recognized as essential to intelligent management in any field of industry. In the past few years an increasing amount of statistical information regarding various divisions of trade and industry has been made available. It is now proposed to standardize and extend the collection of statistics regarding employment and earnings of labor so that they will be inclusive of all important industries, promptly available and national in scope, making possible a national index.

The President's Conference on Unemployment in 1921 tried to determine how many persons were unemployed, to ascertain the extent and character of the emergency then confronting the country. On the basis of studies made, however, the best estimate it was able to make was that the unemployed numbered between 3,500,000 and 5,500,000, or a discrepancy between the minimum and maximum figures of 2,000,000. The experience in the unemployment crisis in 1921 seemed to show that facts about unemployment are needed primarily as a guide for programs of relief, and that for this purpose they must relate to particular communities, while facts about fluctuations in employment are needed as a guide for controlling policies in industry and for light upon problems of the business cycle and of waste in industry.

A Committee on Measurement of Employment was authorized at the annual meeting of the American Statistical Association in December, 1921. Miss Mary Van Kleeck, a member of the Committee on Unemployment and Business Cycles, appointed by Secretary Hoover at the conclusion of President Harding's Conference on Unemployment, and designated by the Russell Sage Foundation to conduct the inquiry into employment statistics for that committee, was selected as chairman of the new committee of the American Statistical Association, which is now designated as the Committee on Governmental Labor Statistics. In a book, entitled "Employment Statistics for the United States," recently published by the Russell Sage Foundation, New York, a plan is outlined by the committee of the American Statistical Association for the national collection of employment statistics.

Plan Is Simple

Since most industrial establishments during the past few years have been harassed by Governmental departments and private agencies which either solicit or demand long schedules of information, difficult if not impossible to supply and frequently involving duplication, a prejudice has been created against all new requests for data. For that reason it is planned to limit the inquiry to two main questions: (1) The total number of employees on the payroll and (2) the total wages paid in one payroll period.

Assurance will be given by the collecting bureau that the reports will be held in strict confidence, that neither the facts reported for any one plant nor the identity of any reporting firm will be disclosed either directly or indirectly. In addition, each firm will be promised a copy of the periodic compilation in which its figures and others are incorporated, thereby affording it a useful check upon its competitive position.

The interval between reports will be one month, and the questions asked are to be answered for the payroll period which includes the fifteenth of the month. The statistics compiled will be made available as promptly as possible, so that timely action may be taken whenever the information indicates an abnormal condition of business.

Importance of Employment Trend to Business Management

The manager of a business, says the book, must reach decisions regarding the proper rate of production in his plant during a given period of time, if he be a manufacturer, or the volume of his trade, if he

be a distributor; the proper distribution of his own costs doing business; the right time to buy and the right price to pay for his raw materials and the goods in which he deals; the need for expanding or leaving unchanged his equipment and capitalization; and, as the key to all these other decisions, the expected requirements of purchasers, the kinds of goods desired, the time of sale, the probable selling price, and the communities in which he will sell.

The trend of employment and earnings, if available for different industries and for particular communities, would enable him to compare his own plant with others in his own industry and his own city; to have an index of activity in the industries from which he buys, and in those businesses to which he sells, if he deals in production goods; and finally, if he deals in consumption goods, to have some knowledge of the purchasing power of the ultimate consumer in the communities where he makes his sales, or where the goods into which his product enters are ultimately sold.

Besides reaching current decisions, he will seek to develop policies in regard to employment in his own plant, and to eliminate wasteful fluctuations in his labor force. Data on employment and earnings in other plants afford a background for study of his own labor problem.

Employment a Measure Common to All Business

A chief advantage of employment statistics as a measure of economic activity, according to the book, is that they afford a measure common to all business. One can count the number employed and so register changes alike in a cotton mill and an automobile factory, a department store and a bank, in a restaurant and on a farm. In addition, a change in numbers employed is a forecast of change in activity and registers it slightly in advance of fluctuation in production. The laying off or the taking on of workers is advance notice of contraction or expansion of business.

Data on employment and earnings in certain industries are now collected monthly by the Federal Bureau of Labor Statistics and by several State bureaus. It is planned to eliminate duplications of effort in this direction and to coordinate the work with the Federal bureau as a center. It is also planned to make the statistics more comprehensive in scope, so as to include manufacturing in its main industrial divisions, mining and quarrying, communication, building construction, wholesale trade, retail trade, logging and lumber work, and agriculture. Care will be taken so that the proportion or "sample" of each industry covered by the statistics will be sufficient to be truly representative.

More Than 90,000 Miles of Oil Pipe Lines

WASHINGTON, Feb. 5.—A survey of petroleum pipe lines recently conducted by the Bureau of Mines, Department of Commerce, shows a total of slightly more than 90,000 miles of pipe lines in the United States. The pipe lines vary in diameter from 2 in. to 16 in., the most common size being 6 in.

The grand total of tankage, exclusive of producers' storage at the wells, available in the United States for the storage of crude petroleum and of petroleum products at refineries on May 1, 1926, amounted to over 800,000,000 bbl. of 42 gal. Of the total tank capacity, nearly 500,000,000 bbl. was at tank farms and over 300,000,000 bbl. at refineries.

There are four types of storage, steel, wooden, earthen and concrete. Steel storage is by far the most widely used and comprises 80 per cent of the total. Concrete storage is of fairly recent origin and finds almost exclusive use in California, where the presence of much flush production in 1923 made the immediate construction of large reservoirs imperative.

A simple construction of steel switchboard panel, with several outstanding advantages, can now be furnished by the General Electric Co. The new panels are made in standard widths of 16, 20, 24, 28 and 32 in., with a standard height of 90 in.

CORROSION OF STEEL

Ship Plates and Rivets Subject to Special Conditions—Deterioration Rapid

TWO papers read last fall on the corrosion of steel members studied the question from differing viewpoints. F. N. Speller, metallurgical engineer National Tube Co., Pittsburgh, read a paper, "Corrosion of Structural Steel," before the American Iron and Steel Institute, this having been reported in THE IRON AGE of Oct. 28, page 1200. A few days later W. Bennett read a paper before the Society of Naval Architects and Marine Engineers at New York, calling attention particularly to the corrosion of ship plates and rivets.

Some of Mr. Bennett's examples indicate the rapidity with which the deterioration takes place in unprotected steel subjected to the action of sea water, and even in steel which has the protective covering of a paint coating. He referred to vessels which were dry-docked for repairs and in which thousands of examples of corroded rivet points were found.

An oil tanker built in 1918 went into drydock in 1925. She had been docked about nine months before. On the occasion in question, however, 113,000 steel rivets were cut out and renewed and about 2000 more were recalked. Several shell plates had to be renewed on account of corrosion damage to the butts and seams.

A freighter built in 1920 and drydocked in 1925 had so many rivets damaged that about 108,000 had to be replaced. Nearly all of these rivets were removed on account of general wastage and corrosion. One year had elapsed since the previous drydocking.

Other examples were cited, all being considered as typical, showing the nature of the trouble from which seagoing ships suffer. Many of the rivet points, on being cleaned off, showed the rivets wasted away to $\frac{1}{4}$ in. below the surface of the plating. In extreme cases this depth went as far as $\frac{3}{4}$ in. The point of the rivet showed a honeycomb appearance. In some cases the tip of a knife blade could be inserted all around the point.

What Caused the Trouble?

It was found difficult to provide a satisfactory explanation which would fit the serious condition. Vari-

ous suggestions were advanced, such as the rubbing of the vessel's bottom in a canal or shallow river at shoal water ports, causing mud to lodge at seams, butts, and protruding rivet points. Vessels trading in deep water continuously were not affected so extensively and corrosion was not so severe. The scoring action observed in some cases was so bad that some of the bottom plates had to be renewed. In one instance this was the case over nearly the entire length of a ship. In this particular case, however, the rivets were of iron and were not found scored or corroded below the surface level of the plate.

Chemical action, due to impurities in the water, such as come from chemical works, fertilizing and oil plants, etc., has sometimes been blamed. The long periods between successive dockings of the ship are pointed to as accentuating the trouble. Lack of sufficient time in drydock for adequate cleaning and re-coating, insufficient amounts of paint applied and inefficient methods of applying it, all have been blamed.

Other statements have gone back to the constructional period, where blame is placed on rivets overheated, pneumatic hammers not properly used, and too short a stroke in the hammer to stave up the rivet properly. The result is that the point is battered up but the body of the rivet is not staved. This leaves a small bearing surface and makes the rivet "work" when stress comes upon it.

Some Conclusions

Iron rivets are reported less liable to be spoiled by overheating than steel rivets. Being softer, they do not have to be heated to so high a temperature. Whether a general return to iron for rivets for ship bottoms in the case of vessels trading to shoal water points will be made is questionable. The author points out that the price element is a heavy factor and that mechanical puddling may be necessary before this point is reached.

American oil tankers are found to suffer more from wasted rivet points than from pitting of plates. In British tankers the reverse seems to be the case. A suggested explanation is that the steel rivets used in American tankers have frequently been found electro-positive to the plates, thus causing wastage on the rivets. Iron rivets in British tankers, on the other hand, are usually electro-negative to the plates, thus tending to cause corrosion, or to accelerate pitting, on the plates themselves.

Dipper Dredge of Unusual Size Is Electrically Operated

Utilizing a dipper pull of 350,000 lb., more than the pull of the largest dredges used in the construction of the Panama Canal, the Diesel-electric dredge *Crest*, owned by the Great Lakes Dredge & Dock Co. and now being used for rock removal work in New York harbor off Staten Island, is said to be the largest and most powerful dipper dredge ever built.

This dredge, which was built by the Bucyrus Co., Bucyrus, Ohio, is 167 ft. long and 48 ft. wide. It is not self propelled, but otherwise is completely electrified, General Electric equipment having been used throughout. The main power plant consists of two 600-hp., Fairbanks-Morse, 6-cylinder Diesel engines of the 2-cycle solid injection type, driving direct current generators supplying 230 volts. For standby purposes a 120-hp. 2-cycle Diesel engine is used. Two 125-volt generators, driven by two $7\frac{1}{2}$ -hp. Diesel engines, furnish lighting current.

The equipment is designed to dig in blasted or partly blasted rock, and because of the severity of its present duty the dipper now in use has a capacity of but 10 cu. yd. For lighter work a dipper of 15 cu. yd. capacity may be utilized.

Seven main motors with a total rating of more than 1400 hp. are used in the dredging operations. These drive the thrust, hoist, backing, swing and spud machinery. The spuds alone are 85 ft. long and 51 in. square. The entire equipment of the boat includes 35 electric motors. The main hoist is of the single-part

type and operates through twin cables 2 $\frac{1}{2}$ in. in diameter, reeved over 9-ft. boom point sheaves. The dredge is designed to dig to a depth of 52 ft.

To Investigate Iron Ore Deposits on Hudson Bay Coast

TORONTO, ONT., Feb. 4.—Capt. J. E. Bernier, noted Arctic explorer, who has led many Government trips to the Arctic, will go into Hudson Bay this year with the expectation of taking the first step toward founding a great iron and steel industry there. He has been commissioned by British steel makers to mine and bring out 500 tons of iron ore from the Nastapoka Islands on the east coast of Hudson Bay. He will take miners with him and a string of barges to be used as lighters between shore and ship. The ore will be taken directly to England and tested there. If it turns out to be what advance reports indicate, a practically unlimited supply of high grade ore is in sight. In addition Captain Bernier's party will study the power possibilities of the Whale River where it empties into Hudson Bay behind the Iron Islands. If sufficient power is available near the outlet, and it is believed there is, the British steel interests who are financing this test trip, plan to investigate the possibilities of building an electric furnace plant on the spot. The Canadian Government is also interested in the Bernier expedition and proposes to ask permission to send along some experts to look over conditions in Hudson Straits during the time Captain Bernier's vessel is in the bay.

WORCESTER SAFETY CONTEST

Hazards of Industry Reduced in Manufacturing Plants by Competitive Efforts

BY JOHN NELSON

THE experience of Worcester Safety Council, Worcester, Mass., in 1926, in conducting a lost-time accident contest among the manufacturing plants of members, again demonstrates what persistent interest and effort will accomplish in reducing the hazard in industry. The 43 plants which reported to the council in the year averaged 25,586 employees. The companies included most of the large and some of the small metal-working establishments of Worcester and surrounding towns. Five of them employed more than 2000 men each. Seven others had more than 500 each on their payrolls.

The reduction in number of accidents and the degree of their seriousness as measured in days lost, taking the period of five years, is impressive. In 1922 there were four accidents per 100 employees, involving 73.6 lost time days per 100 persons. In 1923 the frequency of accidents increased to 4.35 per 100 employees, the lost-time days being slightly reduced to 71.6 per 100. The improvement began in 1924, when the percentage of accidents fell to 2.62 and the percentage of lost-time days to 44.3. In 1925 the record was not quite so good, with 2.73 accidents and 55.2 lost-time days per 100 persons. But 1926 made a new low record with 2.5 accidents and 41 lost-time days per 100 persons.

The year had 639 accidents. Had the percentage been as high as in 1922, the number would have been well above 1000. On the basis of the 1923 percentage, it would have been more than 1100. In 1926 accidents caused a loss of 10,483 hr. Had accident prevention methods been the same as in 1922, the theoretical loss last year would have been nearly 19,000 hr.

Records of Individual Plants

The Machine Division of the Norton Co., ranking fourth among the 43 plants, averaging 417 employees during the year, had but two accidents, causing 43 lost-time days. The number per 100 employees was only 0.48. Similarly the Wheel Division of the com-

pany, employing 2090 workers, had 12 accidents and 335 lost days, which ranked it fifth, with 0.57 accident per 100.

The South Works of the American Steel & Wire Co. ranked eighth, employing 2621 men, and having 21 accidents and 1211 lost-time days, or 0.80 accident per 100 people, a low record for a mill of this description. Central Works of the same company stood next in rank, No. 9, employing 236 men, having three accidents and 37 lost days. The North Works ranked 17, with 1632 employees, who suffered 31 accidents, causing 788 lost days. Goddard Works of the Wickwire-Spencer Steel Co. ranked 14, with 752 men, and 13 accidents and 196 lost days per 100 employees. Morgan Works of this company ranked 21, with 308 workers, eight accidents and 96.5 lost days.

The Graton & Knight Mfg. Co., manufacturing leather belting, ranked 15, with 1189 persons, 21 accidents and 305 lost-time days. Heald Machine Co. ranked 16, with 327 employees, six accidents and 110 lost days. Reed & Prince Mfg. Co., with 918 persons, had 23 accidents and 528 lost-time days. The carpet mill of the M. J. Whittall Associates, employing 1208 men and women, ranked seven with nine accidents and 40 lost days. Baldwin Chain & Mfg. Co., employing 291 men, had seven accidents and 123 lost days.

Average Brought Down by Inefficient Plants

The year's average was pulled down by plants which have not gone ahead with safety work as rapidly or as efficiently as some of the others. One plant had 20 accidents among 250 men, giving it a rating of eight per 100, which compared significantly with the 0.48 of the Norton Co.'s Machine Division and the 0.80 of the South Works, American Steel & Wire Co.

The Worcester contest is unique in that nothing like it has been attempted elsewhere on so large a scale. Early in its history, a number of years previous to 1922, the experience of members was a wholly different story from that of today. Accidents were much more numerous, and their degree of seriousness very much greater. The reduction in average time lost per accident is fully as notable, perhaps more so, as in the number of casualties. It proves that the injured man, receiving immediate skillful treatment, seldom is put back by septic poisoning and other old-time handicaps against quick recovery.

Tests of Large Columns with H-Shaped Sections

Technologic paper No. 328 of the United States Bureau of Standards discusses in 88 pages the results of tests of large columns in the 10,000,000-lb. testing machine of the bureau. Five different types of construction, represented in 69 separate columns with H-shaped sections, were employed. There were light and heavy fabricated plate and angle sections, light fabricated channel sections, and light and heavy solid rolled sections. Cross sectional areas were approximately 35 sq. in. for the light sections, and 85 sq. in. for the heavy sections. The lengths were 12, 18 and 24 ft., giving slenderness ratios varying from 38 to 92.

No differences in column strength, attributable definitely to the differences in type of construction, were found. The pick-up of load, however, showed marked differences due to differences in construction. Over the range of slenderness ratios only a small decrease (approximately 6 per cent) of column strength was found with an increasing slenderness ratio.

Importance of Yield Point Accuracy

Yield points determined in commercial mill tests of the material apparently bore no relation to the strength of the columns. In view of the controlling influence of the yield point of the material upon the strength of columns, a more precise standard definition and method of measurement of yield point is declared to be needed. The tensile yield point of the material, determined under uniform test conditions from coupons cut from the

columns, furnished a close measure of the column strength.

All the columns were sturdy in design, having webs and flanges sufficiently thick to prevent secondary or delayed failure. The report, which was prepared by L. B. Tuckerman and A. H. Stang, may be obtained at 40c. from the Superintendent of Documents, Government Printing Office, Washington.

New Use for Rust-Resisting Sheets

A new use for rust-resisting sheets has been found in the smoke pipe between chimney and domestic furnace. The accumulation of scale in winter and the inroads of corrosion in summer materially shorten the life of ordinary pipe for this purpose. In recommending Ascoloy sheets, a chrome iron product of high resistance to corrosion, for smoke pipes, Joseph T. Ryerson & Son, Inc., offers a 10-year guarantee. The long life of the material, it is said, more than offsets its cost, which is three and one-half to four times that of galvanized sheets.

Ascoloy sheets are carried in No. 24 gage, 24 in. wide and 120 in. long, with a white pickled finish, and can be readily formed into elbows, 45-deg. bends and straight lengths of pipe, since the material is soft enough to be double-seamed without difficulty.

The ability of the metal to withstand continuous heat without forming scale also suits it for other uses, such as for oven linings and gas stove bottoms. The sheets, it is stated, withstand a temperature up to about 1500 deg. Fahr. without scale formation.

MARKET RESEARCH

Subcommittees Appointed for Specific Fields of Study and to Assemble Data

WASHINGTON, Feb. 7.—Organized last October to cooperate with Federal, State and private agencies in the collection and distribution of statistics and consideration of other phases of gathering material, appointment of seven subcommittees of the Market Research Conference was announced last week by the Department of Commerce. The conference was formed at a meeting of distributors, advertising agencies and government officials to consider a list of fundamental research projects in the field of marketing which have a common interest of value for those engaged in the work of market research.

Trade associations and other interested commercial bodies will be asked to assist the work of market research by expanding and detailing the reporting of sales volumes of various marketing agencies subdivided into geographical divisions. Means for renewing, extending and expanding a study of consumer expenditures will be taken up by the subcommittee on cost of living studies. The personnel of the subcommittees follows:

Subcommittee on Census of Population: E. M. West, K. H. Fulton, Outdoor Advertising Association, New York,

chairman; Wilford I. King, National Bureau of Economic Research, Inc., New York; H. G. Weaver, General Motors Corporation, Detroit; Frederick D. Wood, International Magazine Co., New York.

Subcommittee on Census of Manufactures: Malcolm Muir, McGraw-Hill Publishing Co., New York, chairman; F. R. Davis, General Electric Co., Schenectady, N. Y.; E. F. Du Brul, National Machine Tool Builders' Association, Cincinnati.

Subcommittees on Statistics of Income (Treasury): G. E. Piper, *Household Magazine*, Chicago, chairman; R. O. Eastman, R. O. Eastman, Inc., Cleveland; H. G. Weaver, General Motors Corporation, Detroit.

Subcommittee on Market Research Projects: P. T. Cherington, J. Walter Thompson Co., New York, chairman; F. R. Davis, General Electric Co., Schenectady, N. Y.; F. M. Felker, Associated Business Papers, New York; E. T. Hall, Ralston-Purina Co., St. Louis; A. Heath Onthank, Department of Commerce, Washington; C. C. Parlin, Curtis Publishing Co., Philadelphia; W. A. Thompson, American Newspaper Publishers' Association, New York.

Subcommittee on Cost of Living: W. A. Berridge, Metropolitan Life Insurance Co., New York, chairman; J. W. Hayes, Crowell Publishing Co., New York; Wilford I. King, National Bureau of Economic Research, Inc., New York.

Subcommittee on Cooperation with Universities: E. E. Day, University of Michigan, Ann Arbor, Mich., chairman; N. A. Briscoe, New York University, New York; P. T. Cherington, J. Walter Thompson Co., New York.

Subcommittee on Collection of Sales Statistics: E. T. Hall, Ralston-Purina Co., St. Louis, chairman; W. A. Berridge, Metropolitan Life Insurance Co., New York; E. Smith, Fuller Brush Co., Hartford, Conn.

CANADIAN PIG IRON GAINS

Steel Production, However, Remains Disappointingly Low, Due to Heavy Imports

In 1926 the Canadian iron and steel industry showed improvement in production over the previous year, largely because of the pronounced prosperity of the construction and automotive industries, and the improved conditions of Canadian railroads as reflected by large orders for rails and new equipment. Production of pig iron during the year totaled 737,503 gross tons, an increase of 29 per cent over the 570,397 tons of 1925; while steel ingots and direct steel castings at 776,888 gross tons showed a slight gain over the 752,695 tons made in 1925.

While the greater tonnages indicated general improvement, the returns to the industry were restricted by lower prices prevailing. Imports of European steel into the Maritime Provinces and Montreal tended to keep prices down, especially where these came in strong competition with Canadian products.

A review of the price trend for 1926 shows that iron and its products fluctuated within narrower limits and at lower levels than in 1925. Based on 1913 prices as 100, the Dominion Bureau of Statistics index was 147.5 in January, the high point of the year. It gradually declined to 143.5 in June, the low point of the year, and then rose slightly each month to 146.0 in December. In 1925 the highest point for the year was reached at 158.8 in February and the lowest at 147.1 in November.

Of the 737,503 tons of pig iron produced in 1926, blast furnaces in Ontario made 488,000 tons, or 66 per cent of the year's output, against 65 per cent for 1925. The remainder was accounted for by Nova Scotia furnaces in both years.

Imports of Steel Hamper Home Production

R. H. McMaster, president Steel Co. of Canada, Ltd., explains the "rather mixed situation," in which "production of pig iron shows a most satisfactory gain," while "the steel situation shows quite different conditions. Importations of pig iron are relatively limited, while imports of steel are extremely heavy.

"It is evident that the consumption of steel during 1926 was much greater than in 1925. As the production for the two years may be said to be almost equal, it requires no other proof to establish the fact that our increased consumption was supplied by importations.

Such results, therefore, cannot be accepted as satisfactory to an industry which ought, with good reason, to entertain hopes of keeping in step with the progress of this country. The existing capacity to produce steel in Canada could provide almost double the tonnage shown by the production figures for 1926."

Steel Corporation Pension Fund Disbursements for 1926 Announced

The sixteenth annual report of the United States Steel and Carnegie Pension Fund shows that \$2,537,917 was distributed in 1926 as pensions among retired employees of the United States Steel Corporation and its subsidiary companies, as compared with \$2,068,653 in 1925. The Carnegie Steel Co. was first in amount of disbursements, its beneficiaries having received \$615,605; retired employees of the American Steel & Wire Co. received \$557,044, and disbursements among some of the larger subsidiaries were as follows: American Sheet & Tin Plate Co., \$347,505; National Tube Co., \$241,976; H. C. Frick Coke Co., \$196,531; Illinois Steel Co., \$130,057; American Bridge Co., \$120,803; Oliver Iron Mining Co., \$105,202; Tennessee Coal, Iron & Railroad Co., \$35,802; Bessemer & Lake Erie Railroad Co., \$35,033; Elgin, Joliet & Eastern Railway Co., \$28,442; Duluth & Iron Range Railroad Co., \$19,084, and Pittsburgh Steamship Co., \$15,420.

During 1926, 1185 employees were added to the pension roll and 532 were removed by death. At the close of the year there were 5737 men on the pension list. The average of the 1185 employees retired in the year was 62.79 years, their average period of service, 31.57 years, and the average monthly pension, \$47.05. Since the inauguration of the pension plan on Jan. 1, 1911, \$15,833,726 has been paid in pensions.

Diamond Drilling

Bulletin 243 of the United States Bureau of Mines covers the subject of diamond drilling in a pamphlet of 178 pages. It was written by Frank A. Edson and copies may be obtained at 35c. from the Superintendent of Documents, Government Printing Office, Washington. The machinery and tools used in diamond drilling are taken up in order, followed by nearly 60 pages devoted to the operation of the diamond drill in all its ramifications. The bulletin makes special reference to oil-field prospecting and development. There are 39 cuts, including both line-cuts and halftones.

New Haven Machine Tool Exhibition in September

The seventh annual machine tool exhibition will be held Sept. 6, 7, 8 and 9 at the Mason Laboratory of Mechanical Engineering, Sheffield Scientific School, Yale University, New Haven, according to an announcement made this week. Owing to the increasing scope of the exhibition it has been decided to change from an annual to a biennial exposition, to be held in odd years, beginning with 1927. The exhibition, founded in 1921, is sponsored by the New Haven section of the A.S.M.E., the department of mechanical engineering of the Sheffield Scientific School, and the New Haven Chamber of Commerce.

Harry R. Westcott, New Haven, has been chosen again to head the exhibition committee. He will have the assistance of Ernest Hartford, American Society of Mechanical Engineers, New York; J. D. Marsh, chief engineer of the Mason Laboratory, who will be superintendent of the exhibition; S. W. Dudley, Strathcona professor of mechanical engineering, Sheffield Scientific School, and N. H. Brooks, also of the Sheffield school.

As in the past, technical sessions will be held in conjunction with the exhibition, a feature this year being the divisional meeting of the machine shop practice division of the A.S.M.E. One of the important exhibits planned is a display showing by means of graphical illustration the evolution and development of certain types of machine tools from their beginnings up to the present stage. It has also been decided to devote space this year to exhibits of machine shop accessory equipment.

Carries Steel Fabricators' Message to Seattle

SEATTLE, Jan. 31.—Charles F. Abbott, executive director and Lee H. Miller, chief engineer of the American Institute of Steel Construction, Inc., were visitors in Seattle during the first three days of last week holding conferences with the steel fabricators, engineers and architects of that city. The first day, Monday, was devoted to a conference with the five leading Seattle fabricators following a luncheon at the Rainier Club and a dinner in the evening to which the architects and engineers and contractors were invited as guests of the fabricators. The dinner was attended by about 200.

On Tuesday, Mr. Abbott appeared before the Seattle Advertising Club at a noon luncheon, and talked on the greater field for advertising that is developing by reason of the new forms of competition.

The Seattle members of the institute are the Wallace Bridge & Structural Steel Co., Pacific Car & Foundry Co., Bacon & Matheson Forge Co., Isaacson Iron Works and Hofius Steel & Equipment Co.

Complaint Against Wheel Makers Focuses Attention on Pittsburgh Plus Order

WASHINGTON, Feb. 8.—While under its policy of procedure the Federal Trade Commission will disclose no information about the matter, it has become common knowledge that the city of Detroit has made application to the commission for the issuance of a complaint against manufacturers of rolled steel carwheels on the charge that they are violating the cease and desist order in the Pittsburgh Plus case. The complaint of the city of Detroit is understood to be based on the contention that uniform prices, f.o.b. Detroit, have been quoted on the wheels. It is alleged that the delivered prices, being uniform, disregarded the sources of manufacture of the carwheels, assuming that costs of production are the same, or practically so. It is understood that inasmuch as the Pittsburgh Plus order was directed only against the United States Steel Corporation subsidiaries, it can have no bearing on the Detroit case. Whether or not that city will attempt to get a complaint issued on other grounds, such as alleged discrimination, remains to be seen.

The action of Detroit had led to reports that application has been made to the commission for issuance of

a complaint against the entire iron and steel industry on the charge that it is violating the Pittsburgh Plus order in its method of quoting prices. As a matter of fact, it is known that no such application has been filed, although it is understood that an informal complaint has been made to the commission that the steel industry is violating the spirit of the order, though the order did not issue against the whole industry. It has been contended, however, that the order could be supplemented by the proper procedure, in case of the necessary proof, to include the entire industry. The outstanding feature of these protests, it is stated, is that many quotations, whether on a f.o.b. mill basis or not, work back to a Pittsburgh Plus basis. The contention has been made, however, that even though this were true, there is nothing in the order to prevent it.

Foundry Equipment Manufacturers Elect Officers

At the annual meeting of the Foundry Equipment Manufacturers' Association, at Cleveland, Feb. 1, Thomas W. Pangborn, Pangborn Corporation, Hagerstown, Md., was unanimously elected president for the ensuing year. S. C. Vessy, W. W. Sly Mfg. Co., Cleveland, was chosen vice-president, and H. Cole Estep, West Third and Lakeside Avenue, Cleveland, was re-elected secretary-treasurer. E. O. Beardsley, Beardsley & Piper Co., Chicago, and N. S. Lawrence, Whiting Corporation, Harvey, Ill., were elected directors for three years from Feb. 1.

Reports on business conditions in the foundry equipment field indicated that, although there may be some uncertainty concerning the outlook for the whole year, the first quarter will bring satisfactory returns equal to the rate of operations last year.

Addresses were made by W. J. Barrett, policyholders' service bureau, Metropolitan Life Insurance Co., New York, and Dan M. Avey, editor *Foundry*, Cleveland.

General Fireproofing Co. Observes Twenty-fifth Anniversary

The General Fireproofing Co., Youngstown, last week observed the end of its first quarter century of the successful manufacture of steel office equipment and kindred products. Organized with a capital of \$500,000 when a group of men associated with the Federal Bronze Co., Youngstown, purchased the plant of the International Lath Co., Niles, Ohio, the company has grown until it now has a capital of nearly 2½ millions, an accumulated surplus from earnings of more than 4½ millions, and is the largest manufacturer of steel desks in the world. W. H. Foster, who is now president of the company, was its first secretary, and some thirty of the present employees have been associated with the company for 20 years or more.

Metric System Bill Again Defeated

WASHINGTON, Feb. 8.—The metric bill again has been defeated. The Senate committee of commerce has voted "non-action" on the measure. Also, the committee voted down the proposal for a resolution requesting the Bureau of Standards to conduct an investigation regarding the system.

The Laclede-Christy Clay Products Co., St. Louis, one of the large producers of refractory materials, which was founded by James Green more than 80 years ago and who guided its destinies until his death in 1914, is the subject of an historical sketch recently published in the *St. Louis Globe-Democrat*. The business has come up from small beginnings to one having a capital investment of about \$5,000,000. John Leigh Green, son of the founder, is its president, and other officers are: W. J. Westphalen, vice-president and general manager; John H. McKelvey, vice-president in charge of sales, and J. M. Baggot, secretary.



BOOK REVIEWS



Handbook of Domestic Oil Burning. Pages 224, 4 $\frac{1}{2}$ x 7 $\frac{1}{2}$. 97 illustrations. Published by American Oil Burner Association, 350 Madison Avenue, New York, 1926. Price, \$2.75 post paid.

Pioneering in the art of heating homes without coal, this book is designed to further the intelligent use of domestic oil burners, to help substitute proved engineering principles and data for misinformation and to make easier the way of the oil burner industry. The foreword states that it has within its covers all of the fundamental information and data necessary to the successful sale, installation and operation of a domestic oil burner. At the same time the book is issued as a "tentative edition," because of the state of flux of the budding industry and of the hope that errors of omission and commission will be shortly disclosed and corrected.

It starts with a series of definitions and explanations of units and physical facts upon which the whole science of heating is based. Taking up the questions of heat transmission and heating requirements it goes through seasonal demands, considers warm-air, steam and hot-water systems, the relation of the burner to the heating system and the use of oil as a fuel. The subject of fuel oil combustion precedes a consideration of different types of domestic oil burners, including vaporization and atomization produced by a variety of means. Comparative fuel costs are analyzed on the basis of assumed efficiency and combustion of different fuels. These assumptions are subject to considerable variation, and in particular there is a wide variation in prices of fuels in different localities or in different years.

Hazards of oil burning and ordinances governing the use and storage of fuel oil, together with information for the architect, conclude the text.

Arc Welding—The New Age in Iron and Steel. Published by the Lincoln Electric Co., Cleveland. Pages 160, 6 x 9 in., flexible binding. Price, \$1.50 net.

Outstanding in this book is the depicting, by text and illustration, of what has been done by the use of arc welding in the manufacture of iron and steel products. Included also are suggestions as to how the field of welding can be extended, and information is given relating to the redesign of machine parts for manufacture by the arc welding process.

The arc welder is stressed as a production tool, knowledge of the principles and uses of which should be part of the equipment of every designer and manufacturer working in iron and steel. The book contains more than 200 illustrations, chiefly of products manufactured by arc welding. There are also diagrams and charts showing welding speeds and costs.

The relative advantages of rolled steel, welded, as compared to cast iron as a material for manufacturing machinery, are outlined in the first chapter, of 28 pages. Reduction of cost in developing new designs, the elimination of pattern expense, lower material inventory, elimination of obsolete castings because of discontinuance of certain designs of product, reduction or elimination of machinery, and less plant floor space required are also discussed. Addenda to the first chapter offer technical data in support of the economy of substituting arc welded steel for cast iron.

A chapter on the use of arc welding in place of riveting is followed by another of 12 pages on "What Arc Welding Is and What It Does." The latter includes a brief explanation of both the metallic and carbon arc processes and illustrates the butt, lap, fillet and rivet styles of welds. A brief description of other types of welding is given in a one-page addenda to Chapter III.

More than one-third of the book is devoted to a description of the use of arc welding in general manufacturing, to which Chapter IV is devoted. Steps in redesigning a casting for arc welded steel are listed and illustrated data relating to the redesigning bases,

covers and containers are given. A welded base for a floor grinder and for a boring mill are shown and the application of welded steel in lathe construction is discussed. Welded steel covers, including gear guards, doors, pulley housings, etc., are illustrated as well as welded tanks, heating boilers, hoppers, drums, bins, chutes, tumbling barrels, and other containers. Arc welded wheels are also described.

Instructive data are given in an illustrated section devoted to typical welds and short cuts, emphasis being placed on the economy of using standard parts in arc-welded construction. Methods of joining structural steel members for crane runways and roof trusses are shown and the use of arc welding in tool room and in maintenance work are briefly described and illustrated. The chapter concludes with 12 points to remember in redesigning for arc welding.

Chapter V, of 12 pages, deals with the strength of arc welded joints and in Chapter VI, also of 12 pages, data are given the speed and cost of welding. Automatic arc welding, for use in production operations, is taken up in the concluding chapter of the book. Tables of speeds and costs of this welding are included and applications of the automatic process are illustrated.

The Marketing of Metals and Minerals. Edited by Josiah Edward Spurr and Felix Edgar Wormser. Pages, 674. Published by McGraw-Hill Book Co., New York. Price, \$6.

Seeing the need for an encyclopedia on non-ferrous metals and allied mineral products, Mr. Spurr, who is editor of the *Engineering and Mining Journal Press*, and his associate, Mr. Wormser, have brought together within one volume a series of articles giving practical information regarding almost every known mineral product of commercial value.

Starting with aluminum and ending with slab zinc and zinc concentrates, Part I of the book deals with 28 subjects, each chapter written by a specialist in that particular field. Part II is devoted to non-metallic minerals, while Part III contains three general articles, one dealing with metalliferous ores and concentrates, by Arthur B. Parsons; another tells of the methods of trading on the London Metal Exchange, by S. Sussman, and the third presents the case for and against a New York metal exchange, by Mr. Wormser.

The non-ferrous metals and ores covered in Part I include aluminum, antimony, arsenic, bismuth, cadmium, cerium, chromite, cobalt ores and metals, copper, germanium, gold, iron ore and pig iron, lead, magnesium, manganese, molybdenum, nickel, platinum metals, quicksilver, radium, selenium and tellurium, silver, tantalum ores and metal, thallium, tin, tungsten, vanadium ores and metal, slab zinc and zinc concentrates.

Each of these chapters will be found of value, not only by the student who desires to amplify his technical knowledge of a product by facts as to the ways in which it is handled commercially, but also by the purchasing agent or user who may seek a better understanding of the factors which influence the market and prices of the product. Taking the chapter on copper as an example, the author goes into statistics as to world production, American production, uses, names of principal consuming companies, names of principal electrolytic refining companies with estimated capacity of each, commercial specifications, various forms in which copper is cast for commercial use, names of principal selling agencies, range of prices over a period of years, methods of reporting market prices, details as to export markets, and much other related and serviceable information. Many questions about copper which even the fairly well-informed person could not answer offhand may be quickly answered by a reference to this chapter, and the same is true more or less of chapters relating to other products.

Among the non-metallic products to which adequate attention is given are asbestos, barytes, bauxite,

beryl and beryllium, high grade clays, coal, diatomaceous earth, emery and corundum, feldspar, fluor spar, Fuller's earth, garnet, gem stones, graphite, gypsum, Indiana limestone, lithium minerals, magnesite, marble, mica, monazite and thorium, natural hydro-carbons, ocher, petroleum, phosphate rock, potash, pyrites, salt, silica, slate, soapstone, sodium nitrate, crushed stone, sulphur, talc, titanium minerals, tripoli, zircon, zirconium and hafnium.

The material presented, the editors state, has been garnered from the store of information of those familiar with the subjects, and represents the knowledge which they had personally gathered and which they have used, each one in his own work. Much of the information probably is not to be found elsewhere within one volume, and some of it no doubt has never been published before in any form. C. E. W.

Ore, Pig Iron and Steel

Published as part of the volume "Mineral Resources of the United States, 1925," a pamphlet of 40 pages prepared by Hubert W. Davis of the United States Bureau of Mines has just been issued. It covers the iron ore, pig iron and steel production of the country in 1925 and, where possible, gives dollar values, as well as quantities. Copies of the pamphlet may be obtained at 10c. each from the Superintendent of Documents, Government Printing Office, Washington.

Production figures of the various States are given, with comparisons with the preceding year, quoted prices of a number of products are tabulated over a series of months and years, and figures are given on imports and exports. Iron ore production of various countries in the world forms the material for an interesting table covering 1921 to 1925, year by year. The principal producers are shown in the table herewith.

Iron Ore Produced, 1921 to 1925 (Thousands of Metric Tons)

	1921	1922	1923	1924	1925
United States	29,964	47,885	70,465	55,139	62,902
Newfoundland	522	1,014	936	666	915
Cuba	132	452	685	299	567
Chile (Tofo)	48	223	679	988	1,334
Austria	711	1,112	1,211	714	1,030
Czechoslovakia	801	313	675	1,174	1,100
France	14,201	21,106	23,349	28,992	35,741
Germany	5,790	5,795	5,014	4,285	(a)
Luxemburg	3,031	4,489	4,098	5,334	6,672
Russia	170	221	493	931	2,098
Spain	2,602	2,772	3,456	4,613	4,443
Sweden	6,464	6,201	5,588	6,500	8,169
Great Britain	3,526	6,946	11,050	11,228	10,306
China	1,270	1,371	1,401	1,100	1,200
India	957	635	834	1,469	(a)
Algeria	721	1,046	1,448	1,623	1,781
Morocco	115	300	397	(a)	800
Tunisia	266	497	845	798	724
South Australia	515	52	391	590	596

(a) Not available.

Wages and Hours of Labor in Foundries and Machine Shops

Bulletin No. 422 of the United States Bureau of Labor Statistics tells in 160 pages the situation in 1925 as to wages and hours of labor in foundries and machine shops. Copies of the publication may be obtained at 25c. each from the Superintendent of Documents, Government Printing Office, Washington. General tables in great profusion occupy about four-fifths the pages of this bulletin.

Principally they cover the average full-time hours per week, average earnings per hour, average full-time weekly earnings by occupation, sex and State; average number of days on which employees worked, etc., average and classified earnings per hour in 22 specified occupations, full-time hours per week in the same occupations, average and classified hours actually worked in those occupations, and average and classified actual earnings in those occupations by pay period, sex and State.

For intercommunication between its plants in South America, the General Motors Corporation has found the use of the radio successful and advantageous.

Conditions in British and American Coal Mines

Reprint has been made of a series of articles in *Coal and Coal Trade Journal* comparing physical conditions in British mines with those in American mines. Some of the outstanding features brought out in the analysis are covered in the table. It is pointed out that national averages prepared in this manner are weak, in that they hide the extremes. They do not take account of special conditions in special places. To offset this, some of the figures are given in the reprint for a series of different sections, to supplement those for the country as a whole.

Output per man per day is one of the points brought out, in which the American figure for bituminous mines is 4.07 tons and for anthracite mines 1.79 tons. This compares with 0.89 ton in Great Britain in the 7-hr. day, which has been figured up to 1.02 tons in 8 hr.

	Great Britain 1023 ft.	United States Bitu- minous 262 ft.	Anthra- cite 415 ft.
Average depth of workings....	67	49	—
Per cent of output from large mines	50 in.	63 in.	80 in.
Average net thickness of coal bed	18.1	69.5	1.7
Per cent of output cut by machine	0.12 lb.	0.44 lb.	0.68 lb.
Explosives used per ton mined.	42.0	61.4	47.5
Per cent of workers at the coal face	0.89(1.02)	4.07	1.79
Output per worker per day (gross tons).....	2.24(2.56)	7.23	3.98
Output per day per worker at coal face			

Explains High Distribution of Commodities

High distribution of commodities is explained by a statement in Bulletin No. 17 of the National Industrial Conference Board, New York, a pamphlet of 40 pages. It is that the numerical increase in population of the country during the past five years has added to the domestic market 38 per cent more consumers than the entire population of the six New England States.

There appears no widespread tendency to lengthen or shorten the hours of work per week, according to the bulletin, which covers the general business situation. Wages in 1926 showed a slight tendency upward. The cost of living declined from 170.4 in January, 1926, by 3.2 per cent, reaching a minimum in August. A slight increase since then is regarded as probably a seasonal movement.

Gives Data on American Trade Unions

Labor organizations of the United States are listed in bulletin No. 420 of the Bureau of Labor Statistics, United States Department of Labor. The bulletin, recently issued, is under the title of "Handbook of American Trade Unions," and is made up of more than 200 pages.

The data includes the relation of each of the 156 organizations listed to the American Federation of Labor; a brief account of the origin and history of each organization; jurisdiction, both trade and territorial; and form of government. Information is also given on qualifications for membership; apprentice system; method of negotiating agreements; benefits paid; official organ; location of headquarters; extent of organization; and total membership of each union. A table of contents is included to facilitate reference.

The blast furnace of the Mystic Iron Works, Everett, Mass., is pictorially described in a booklet just issued by the William B. Pollock Co., Youngstown, Ohio. The Pollock company built this furnace, the engineering details of which were handled by the Freyn Engineering Co., Chicago. On the front cover of the booklet is a general view of the plant, presenting prominently the ore bridge and showing the facilities for handling water shipments of raw materials. Views of sections of the plant are shown in succeeding pages and the photographs are excellent in clarity and detail.

GREATER IMMIGRATION

Last Half of 1926 Exceeded 1925 by 22 Per Cent
—Net Figure Up by 36 Per Cent

WASHINGTON, Feb. 7.—For the last six months of 1926 immigration totaled 175,955, and emigration 42,779, a net permanent increase to the population of 133,176, according to the Bureau of Immigration. During the last six months of the preceding year, 144,148 immigrant aliens were admitted, and 46,592 emigrant aliens departed; the net permanent increase having been 97,556.

Immigration from countries in the Western Hemisphere for the latest six months was 86,005, a total nearly equal to that from all Europe, which was 86,960. Nearly three-fifths of the total of European immigrants came from three countries, Germany contributing 24,545, Irish Free State 15,188, and Great Britain 12,082, for the half-year. Of the total immigration from the Americas for the same period, 49,335, or 57.4 per cent, entered from Canada, and 29,942, or 34.8 per cent, from Mexico, an increase as compared with the figures for the corresponding six months of the pre-

vious year. The increase from Europe was 12.4 per cent, from Canada only 5.2 per cent, and from Mexico 144.4 per cent.

Labor Admissions Exceed Departures

During the six months July to December last, 33,466 emigrant aliens departed for European countries, and 5514 for countries in the Western Hemisphere. Common laborers admitted from July to December were 25,557. This number, compared with the total laborers of this class departing during the six months, shows a net increase of 6234. Contrasted with the statistics for the corresponding six months of 1925, in which 13,524 were admitted and 21,302 departed, it is seen that more common laborers now enter the United States than depart.

Iron and steel workers coming to the United States during the last six months of 1926 numbered 1117, as against 120 who emigrated. The number of machinists coming to this country during the July-December, 1926 period was 1051, while the number departing was 291. Metal workers coming to the United States during the last six months of 1926 numbered 277, while the number departing was 26.

GERMAN EXPORTS LARGE

Gain of 52 Per Cent in First Half of 1926—Netherlands and England Lead in Purchases

WASHINGTON, Feb. 6.—Totaling 2,271,195 metric tons, exports of iron and steel products from Germany during the first six months of 1926 disclose the comparatively steady increase in the foreign sales made by that country, according to a statement issued by the Iron and Steel Division, Department of Commerce. Exports for the first half of 1926 were greater by 777,260 tons, or 52 per cent, than those of the corresponding period of 1925, with a total of 1,493,935 tons.

"This increase served to continue the comparatively steady gain in the foreign sales of these German products which, commencing in 1923-24 following the termination of the post-war inflation period in 1923, has progressed from an average monthly export of 115,000 tons in 1923 to an average of 378,532 tons during the January-June period of 1926," says the statement. "Imports, on the other hand, amounted to only 444,158 tons in the January-June period of 1926, as against 650,217 tons for a similar period of 1925, a decrease of 206,059 tons, or 31.6 per cent. This decrease may be traced over approximately the same period as that marked by the increasing exports, though it started somewhat later. The 1923 imports averaged 160,541 tons per month, while by 1926, over the first half of that year, this average had been reduced to 74,026 tons per month."

Exports Mainly to Contiguous Countries

It is pointed out that, while the greater part of the foreign sales of German iron and steel products are made in the markets of Europe, imposing quantities are sold elsewhere throughout the world. Using the exports over the first six months of 1926 as a basis, it is estimated that exports to the Far East accounted for approximately one-fifth of the total sales, those to South America for about one-tenth, and those to North America for between one-eighth and one-tenth, the remaining quantity going in greater part to Europe, with some thousands of tons sent to Africa each month.

In the first half of 1926 German exports of iron and steel to the Netherlands totaled 344,838 metric tons, as compared with 294,050 tons in the corresponding period of 1925. Exports to the United Kingdom were 307,911 tons, against 187,250 tons in the 1925 period; shipments to Japan amounted to 189,872 tons, as compared with 24,749 tons in the 1925 period; and 172,784 tons were exported to the United States, as compared with 77,712 tons in the first six months of 1925. Exports to Argentina were 121,717 tons and 92,283 tons, respectively, and those to India and Ceylon amounted

to 122,052 and 54,332 tons, respectively. Shipments to Brazil, British South Africa, China, Italy, Sweden and Switzerland showed gains, while exports to Belgium and Denmark declined during the first half of 1926.

Bars and Hoops Prominent in Exports

Consignments to the Netherlands were more diverse than to any other market, the leading products being sections, bars, hoops, rails and cast iron pipe. The principal products going to the United Kingdom included ingots, bars, hoops, wire and wire manufactures. The leading products going to Sweden were pig iron, rolled and drawn wire, bars, hoops and rails. Of the shipments to Italy, Denmark and Belgium, bars and hoops constitute important items. Bars, hoops, pig iron, plates and sheets are especially important in the trade with Switzerland.

Of the iron and steel sent by Germany to the United States pig iron made up by far the greater quantity, though fairly large tonnages of rails, bars and hoops were included. Girders and other structural materials, bars, hoops, wire and pipe were prominent in the trade with Argentina, while the Brazilian trade is much the same as that with Argentina, except that in this instance rails and accessories replace structural material.

Powerful Oil-Electric Tugboat

Equipped with Ingersoll-Rand engines, what is described as the most powerful oil-electric tugboat in the world has been placed in service in New York Harbor by the New York Central Railroad Co., where it will be used for towing barges and carfloats. The boat has two 6-cylinder, 4-cycle solid injection, 14 x 19-in. oil engines, each direct connected to a 270 kw. General Electric compound wound generator and 30 kw. exciter.

The generating sets operate non-reversing at a constant speed of 265 r.p.m. The generators are connected in series and normally supply 480-volt direct current for the propulsion motor. The boat was built by the Staten Island Shipbuilding Corporation, New York.

"High Silicon Structural Steel" by Dr. H. W. Gillett, is the title of technologic paper No. 331 of the United States Bureau of Standards. The author discusses a new German steel developed in 1925, known as "Freund" steel, and reviews recent American practice in the manufacture of high yield point structural steel. The paper is illustrated with photomicrographs and contains several tables of physical properties.

RISERS CUT WITH BLOWPIPE

Jig Developed by Foundry, to Permit of Guided Hand Cutting, Proves Economical

Economies resulting from the development of a simple jig, for guiding the blowpipe used in cutting risers from castings, are outlined in the following abstract from an article in the January issue of *Oxy-Acetylene Tips*, published by the Linde Air Products Co., 30 East Forty-second Street, New York.

In a large Eastern foundry several hundred castings of the design shown in the illustration (Fig. 1) are included in each day's production. It will be observed that the casting gate rises from a flat surface, and this gate must be removed so the surface will be substantially smooth. Oxy-acetylene cutting was the accepted method, but it was found that toward the

The problem remained as to just what type of machine should be used. Two plans were suggested—the turntable type of machine, and a type consisting of two parallel tables, each equipped with a cutting guide. The latter was chosen and designed according to the illustration (Fig. 2).

Between the two tables is a three-foot trench where the operator stands. Thus a helper would be able to take down the castings on one table and replace them with new ones while the cutter was working on the castings on the opposite table. Since it was decided that a helper could handle at least nine castings on each table, the tables were designed to be about 12 ft. long.

The angle irons connected with the horizontal which supports the cutting blowpipe were fitted with slots which allowed the guide proper to be set at varying distances to suit different castings. Thus, with the slots suitably marked, the cutter would have no diffi-

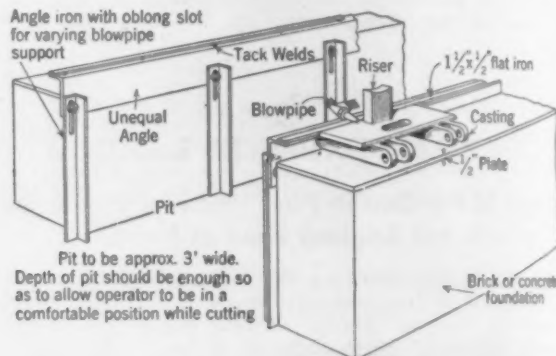
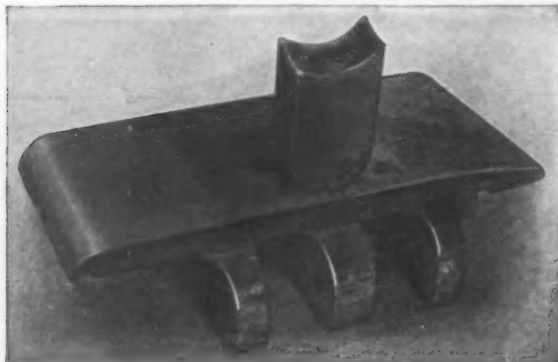


Fig. 1 (at left)—Casting From Which the Riser Had to Be Removed, Leaving a Substantially Smooth Surface. Fig. 2 (at right)—Device adopted to permit of guided blowpipe cutting of the riser stubs

end of each day's work the cutter, through fatigue or carelessness, would fail to cut smooth and flush, leaving a stub sometimes $\frac{3}{4}$ in. high. It was then necessary to do considerable grinding to smooth up the surface; this extra cost averaged 25c. apiece for the wear on grinding wheel and the grinding labor, to say nothing of power, overhead and handling costs.

When it occurred to the foundry manager that the cutting and smoothing operations might be combined by the more efficient use of the oxy-acetylene blowpipe he gave considerable thought to the matter, calling in a local machine designer to advise him.

It was decided that the two-fold job of cutting down the riser stubs to a minimum and leaving the surface even and smooth could best be performed on castings of this kind by the aid of a simple set of permanent guides.

The blowpipe could be operated by a semi-automatic machine, but it was found that such a device would be undesirable. The original cost of such a device would be several thousand dollars, and even after this expenditure it would not be easily adaptable to other similar work.

A compromise between hand cutting and the complete use of machinery brought out a method of guided hand cutting. The case in favor of this compromise system was a strong one. By it the cutter would be able to work in a comfortable position. His line of cut would not depend entirely on the steadiness of his hand, since the blowpipe would be guided along the line of cut. There would be no delay in this work inasmuch as a helper could set up new castings more quickly in the device as designed than an operator could cut the riser. The guide, moreover, would make it possible for the riser to be removed as close as necessary to the body of the casting; while it would be a simple matter to readjust the guide to take various types of the same class of castings. Since this device could be made from material already on hand up in the foundry, its first cost would be very small.

culty in setting up the table height in a short space of time.

With the installation of this simple machine, the foundry was able to eliminate all added expenses of grinding down the riser stubs, and so increase production efficiency and decrease production cost.

Twist Drill and Tap Grinder with Motor in the Head

A combination twist drill and tap grinder with the driving motor mounted in the head, forming an integral part of the machine, has been added to the line of the Gallmeyer & Livingston Co., Grand Rapids, Mich. The armature shaft of the motor carries the grinding wheels and special motor end-bells having ring-oiled phosphor-bronze bearings replace those usually supplied with the motor.

The machine, also available for belt drive, is manufactured in four sizes, designated as the Nos. 10A, 10B, 20B and 20C. The smallest machine is for grinding drills ranging from No. 52 to $\frac{3}{4}$ in. and taps from No. 6 to $1\frac{1}{2}$ in., and the largest, the 20C, has capacity for drills ranging from $\frac{1}{4}$ to $2\frac{1}{2}$ in. and for taps from $\frac{3}{8}$ to 3 in. The Nos. 10A and 10B employ grinding wheels $8\frac{1}{2}$ and 10 in. in diameter, and the No. 20 machines are equipped with an $8\frac{1}{2}$ -in. wheel. A diamond truing device is provided for each wheel. The spindle speed of all machines is 1600 r.p.m. The height to the center of the spindle is 44 in. and the floor space occupied is $2 \times 3\frac{1}{2}$ ft. The net weight of the motor driven units is approximately 450 lb.

Rapid and convenient sharpening of drills is claimed. Minimum of adjustments is a feature stressed, movement of the tailstock to accommodate the length of the drill to be ground being the only adjustment necessary. Adjustment of the lip-rest is not required and adjustments are unnecessary when changing from one diameter of drill to another or

when changing from the grinding of straight shank to taper shank drills. The drill is held in the holder with one hand while the tailstock is brought up to position and clamped with the other hand. The drill holder is placed automatically in the correct position



With the Motor-in-Head Arrangement, the Machine Is Self-Contained. Both taps and drills may be sharpened

with relation to the grinding wheel. A patented holder stop, which works in connection with the diamond truing device, is intended to prevent the holder from coming so close as to damage the lip-rest.

In tap grinding, a feature is the mechanism provided for grinding the taper end of the tap and the clearance back of the cutting edge thus formed. This taper may be as long, as in nut taps; short, as in plug taps; or almost none, as in bottoming taps. The principle is the same in each case, and it is claimed that every flute will have exactly the same angle of taper and just enough clearance so that it will cut freely, but not too much, which would unnecessarily weaken the cutting edge.

Vertical-Spindle Surface Grinder with Motor in Wheel Head

Design of the wheel head, which incorporates a built-in motor, is a feature of a new vertical-spindle surface grinder, recently placed on the market by the Springfield Mfg. Co., Bridgeport, Conn. The machine, shown in the accompanying illustration, has capacity to grind 10 ft. long, 4 ft. wide and 2 ft. under the grinding wheel.

The wheel head is driven by a built-in 30-hp. West-

inghouse alternating current motor, the rotor of which is connected directly to the grinding wheel spindle. The spindle is mounted on heavy-duty ball bearings, each of which is provided with a large oil reservoir and a revolving splasher to assure constant lubrication. The upper ball bearing is mounted in a special cage, equipped with a series of compensating springs, which are intended to take up automatically any play or back lash in the grinding wheel spindle. The spindle is drilled its entire length to permit of supplying the cooling compound to the inside of the grinding wheel.

An 18-in. ring wheel, held in a chuck by means of a bronze clamping ring, is used on the machine. This chuck is bolted to the spindle face-plate and may be removed conveniently for wheel replacements. Power for traversing the table is supplied by a 7½-hp. motor mounted on a platform between the uprights, this motor being used also for elevating the cross-rail and driving the water pump. The coolant supply tank, located at the rear of the bed, is large, and is arranged for convenient cleaning and filling. The weight of the machine is approximately 15 tons.

Welding Blowpipe for Variety of Service

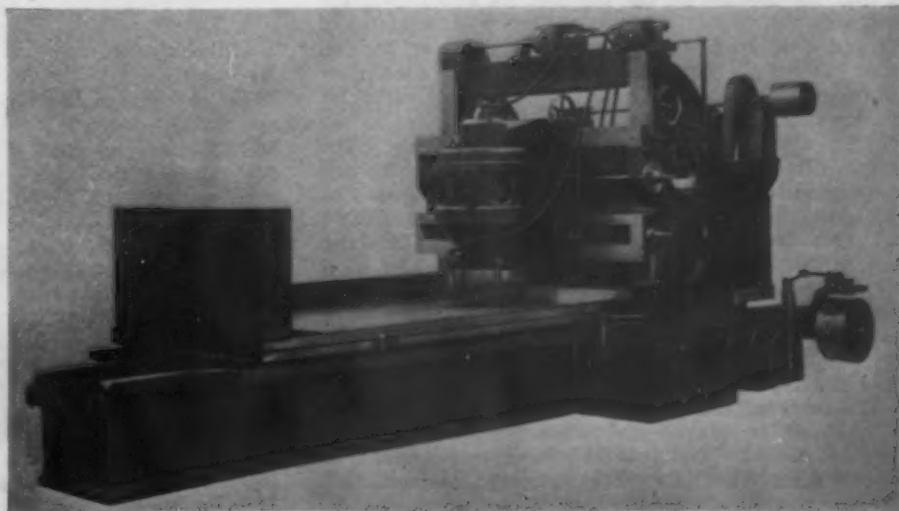
Entrance of the oxygen and acetylene through the inlets at about equal pressure is the outstanding feature of the new Prest-O-Weld W-101 blowpipe being placed on the market by the Oxweld Acetylene Co., 30 East Forty-second Street, New York. The gases are said to be mixed thoroughly in a simple mixing chamber, the mechanical efficiency of which insures intimate mixing under all working conditions, eliminates waste of gases and saves the time of the operator in maintaining the neutral or working flame.

This new blowpipe is entirely of brass and is of simple design. It is screwed together on metal-to-metal seats, without soldered or packed joints, and can be taken apart and reassembled conveniently when minor repairs are necessary. Stems are made in three lengths, 4, 9 and 19 in. long, each of which is made in three angles, 45, 60 and 90 deg. These stems can be fitted to the handle part of the blowpipe by unlocking one union nut, which feature is stressed as increasing the adaptability of the blowpipe to the physical peculiarities of the work in hand, and to the preferences of the operator. The over-all lengths of the blowpipe with the different stems are 15, 20 and 30 in.

Ten interchangeable tips are offered with the blowpipe. Nos. 3 and 4 are of copper-plated brass, and Nos. 5 to 12 are of solid drawn copper. The proper oxygen and acetylene pressures to be used are stamped on each tip. Two stems, the 4-in. and 9-in., 60 deg. angle, and 5 tips, Nos. 4, 6, 8, 10 and 12, are furnished standard with the blowpipe.

The blowpipe is designed for heavy service, and is well balanced. The handle is knurled to permit a firm grip. The new line also includes a cutting blowpipe designated as the C-101, which is intended for service in cutting the lightest and heaviest sections.

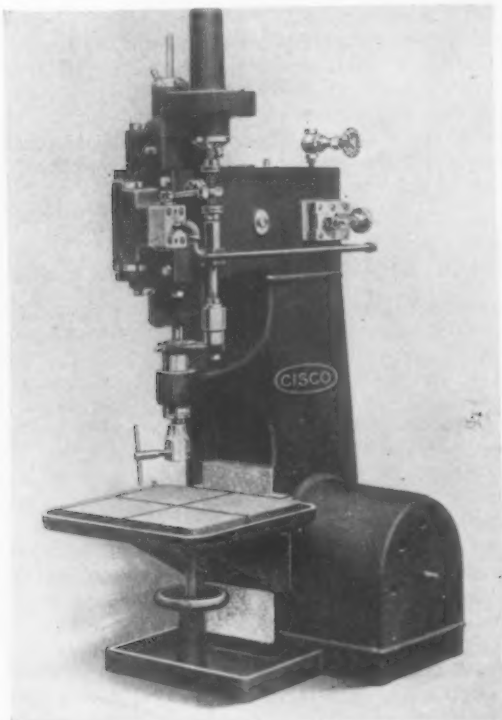
The Grinding Wheel Spindle, Driven by Built-In Motor, Is Mounted in Ball Bearings. Springs are provided in the upper ball bearing to take up spindle play or backlash



High-Speed Automatic Tapping Machine

An automatic tapping machine available in two sizes, for quantity production operations, is being placed on the market by the Cisco Machine Tool Co., Cincinnati. The smaller model of the machine, which is designated as the Multi-tap, is of bench type and is for tapping up to $\frac{1}{2}$ in. in diameter in steel. The larger machine, for tapping up to $\frac{5}{8}$ in. in steel, will be put in production shortly and will be available in both bench and floor types.

The machine can be operated at speeds up to 3000 r.p.m. Operation is fully automatic, the tap being



The Tap May Be Driven at 1000, 2000 or 3000 R.P.M. and All Movements Are Under Positive Control

fed into the work to a predetermined depth, reversed and backed out to the starting point when its direction of rotation is then reversed and the cycle of operation repeated. The operator is free to use both hands and is free to spend his time in supplying and removing the finished work. Magazine feeds, mechanical conveyors and other work handling devices may be applied to the machine, when the nature of the parts to be tapped permits. The machine can be furnished as a single spindle unit, with a combination of spindles in line or spaced around a circle, a special base carrying the different heads.

On this machine a lead screw and nut are employed so that the feeding of the tap and its withdrawal are positively controlled. As it is necessary for the pitch of the screw to be proportioned to the lead of the tap being used, provision is made for the convenient changing of lead screws when required. Reversal of the direction of spindle rotation is by means of an air cylinder using air pressure of 25 lb. or more. The control valve is located at the side of the machine and is operated by a nut on the lead screw, the position of which may be adjusted to assure reversal within 0.001 in. This feature is intended to eliminate breaking taps in blind holes and still assure the cutting of a full thread. Means are provided for automatically compensating for wear on the clutch. There is a safety device for the protection of taps should the operator fail to locate the hole to be tapped and thus allow the tap to hit the top of the work.

The table of the machine is of knee type and may be removed to permit the use of special fixtures. A $\frac{1}{2}$ -hp. motor, built into the base, is employed to drive the machine. Power is delivered through ball bearing cone clutches which are moved from one di-

rection to the other by the air cylinder and are operated by the reversing valve to alternately apply the pressure on either side of the piston as required. Ball bearings are used throughout the machine.

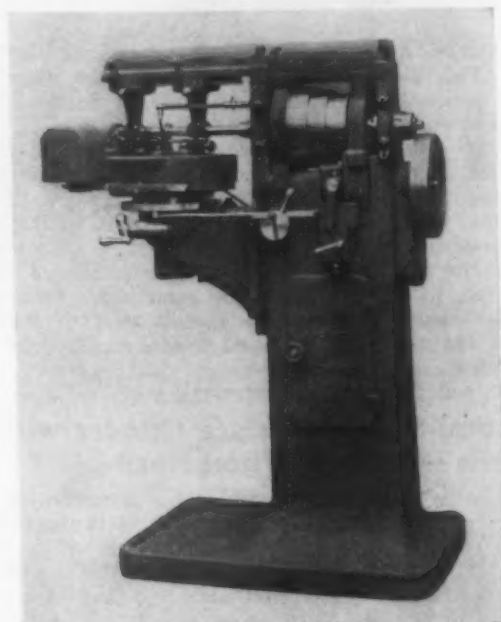
The working surface of the table of the machine illustrated is $11\frac{1}{2} \times 11\frac{1}{2}$. The maximum distance from the table to the chuck is 6 in. The maximum stroke of the spindle is $1\frac{1}{2}$ in. and the minimum stroke $\frac{1}{2}$ in. The weight of the machine is 415 lb.

Automatic Spindle Hobbing Machine

The horizontal automatic hobbing machine here illustrated, a recent addition to the line of the Herman Pfauter Works, Chemnitz, Germany, has been placed on the American market by the O. Zernickow Co., 15 Park Row, New York. The machine is designed for the production of small spiral spindles and spur and spiral gears such as used in separators, talking machines, etc.

The main drive of the machine is by cone pulley from an overhead countershaft. Cutter speeds can be varied to suit the work and the hob. The dividing gear drive, consisting of worm wheel and worm, is accurately mounted and runs in a dust-proof oil bath. The drive is taken from the cone pulley shaft and thence through the index change gears to the dividing worm shaft, so that cutter spindle and work rotate in the correct relation and the indexing is effected automatically.

The work is held horizontally, either between centers or in a draw-in collet. The work-table travels in



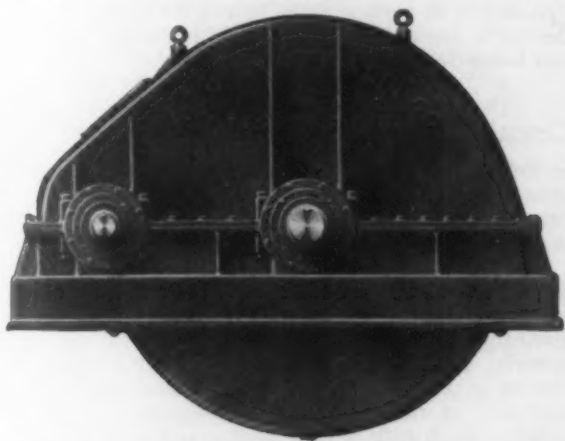
The Machine Is Designed for the Production of Small Spiral Spindles and Spur and Spiral Gears

a swiveling side mounted on the knee of the machine. By means of this slide the blank can be set at any angle to the hob by means of a graduated scale, and spirals up to 80 deg. can be cut. In the case of slender work a small support is used to take up the cutting pressure of the hob. On this machine all the teeth are produced by feeding the work once horizontally across the face of the hob.

Being essentially a production machine, with the range of work limited, no differential gear is provided. The movement that the dividing wheel spindle must make in addition to the indexing movement is calculated in with the dividing change gears. Only those change wheels necessary for cutting the teeth of one spindle are included in the regular equipment. The maximum tooth face that can be hobbled is $5\frac{29}{32}$ in. and the maximum diameter of hob is $1\frac{9}{16}$ in. The number of teeth that can be hobbled ranges from 2 to 100. The net weight of the machine is approximately 1200 lb.

New Reduction Gear Units for Heavy Service

The use of $7\frac{1}{2}$ -deg. single helical gears and of Timken roller bearings are features of a new series of single reduction gear units being placed upon the market by the R. D. Nuttall Co., Pittsburgh. There are six units in the series, designated as the MS and MR, and they cover a range of from 150 to 2000 hp. They are designed for services that require trans-



The Reduction Units May Be Furnished With $7\frac{1}{2}$ -Deg. Single Helical or With Herringbone Gears, and With Sleeves or Tapered Roller Bearings

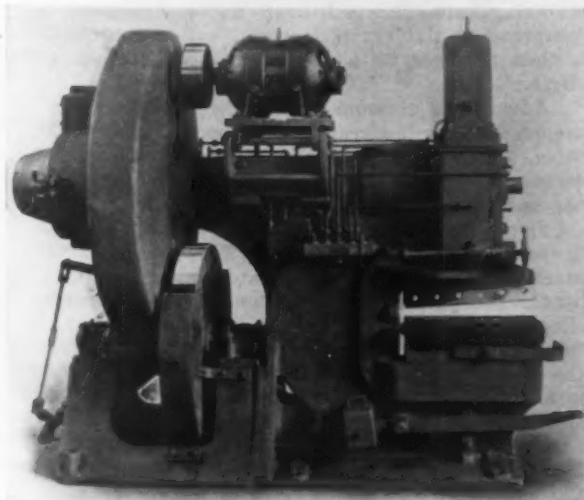
mitting heavy loads at relatively high speeds, such as main and auxiliary drives in steel mills, the driving of crushers, hoists and pumps.

The units are equipped with either the company's $7\frac{1}{2}$ -deg. single helical or with herringbone gears, treated or untreated, depending upon the application, and are furnished either with sleeve or tapered roller bearings. The bearing housings of both types of reducers are identical, and one type of bearing may be replaced with the other. In case of such a change, however, new shafts would have to be provided.

The gears are totally inclosed in a cast-iron case, the bottom of which serves as a reservoir for lubricant. The gears run in a bath of oil and the bearings are lubricated by a positive splash system, the same lubricant being used for both gears and bearings.

Clutch and Centralizer Lubrication Feature Improved Shear

In its new No. 2 vertical shear the United Engineering & Foundry Co., Pittsburgh, introduces a number of features not previously embodied in its small



The Clutch Is of Non-Knocking Type and Is Entirely Inclosed. With exception of main gear and pinion, which run in oil, lubrication is from a single point

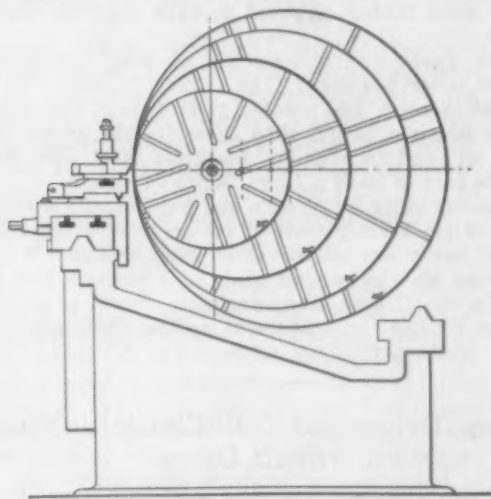
shears. The clutch is of the company's patented non-knocking type, with positive throw-out cam, and is completely inclosed, contributing to greater safety, longer life and quieter running. This type of clutch was formerly used only on the larger shears. On the side of the shear is a grease gun and manifold, providing lubrication of all moving parts from a single point, with the exception of the main gear and pinion, which run in oil.

The shear, which has a stroke of $3\frac{1}{2}$ in. and knives 27 in. long, is intended for cutting multiple strips, bars and rods. The machine illustrated is capable of exerting a pressure of 137,500 lb. between knives and of cutting cold 6-in. x $\frac{1}{2}$ -in. soft steel. It is driven by a 10-hp. motor, mounted on top, and has a double speed reduction. The first is by a belt, through pulley and flywheel, and the second through cast steel cut gear and pinion running in an oil-tight case. The speed of this machine is 35 cuts per min.

Lathe Arranged for Four Swings

The J. J. McCabe Lathe & Machinery Corporation, Singer Building, New York, has announced an improved four-swing model of its "All-in-1" lathe.

The machine is arranged so that one turn of the cross slide crank aligns the lathe for any one of the four swings, 24, 30, 36 and 40 in. The company's patented sliding geared head and drop rear Vee features are incorporated and stops are provided to assure accurate alinement between the spindles on the four sizes



The Lathe Is Arranged for Four Swings, 24, 30, 36 and 40 In. Respectively

of swing. A new feature is a rest for turning rolls and wheels on axles.

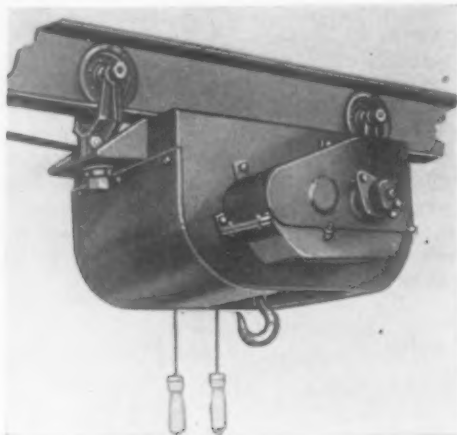
Speed for light work, power for heavy work, and accuracy are claimed for the machine. It is stated that in a test of the first of these new lathes an 18-in. test bar was 0.0005 in. out on 24 in. swing and not more than 0.0025 on the other swings on the same cut. Ease of removing quick change gears and of replacing by special gears for special threads is another feature pointed out by the maker. The saving of shop floor space permitted by the wide capacity of the machine is stressed for this machine, as for the previous models.

"Magnetic Testing" is the title of circular of the United States Bureau of Standards No. 17. Recognizing that the commercial importance of magnetic testing is continually increasing, the bureau has issued this publication which gives a brief discussion of magnetic quantities and characteristics of materials and which outlines the various methods used by the bureau.

The Metal Merchants Credit Association of New York will hold its second annual dinner at the Waldorf-Astoria Hotel, Feb. 10. The association includes various warehouses, handling iron, steel and non-ferrous metals in the New York district.

All-Steel Hoist

Five sizes of an all-steel, electrically welded hoist are being made by the Drake Electric Hoist Co., Inc., Friendship, N. Y. These are built from $\frac{1}{4}$ to 3 tons capacity, and the hook runs up within 15 to 16 in. of



Steel-Frame Hoist Featuring Low Head Room and Accessibility

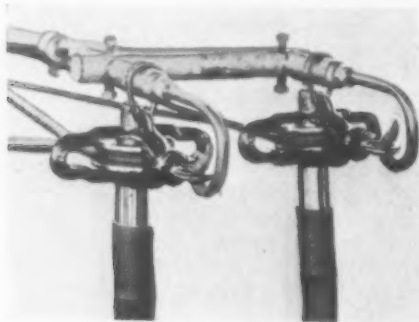
the lower side of the supporting beam. The frames are completely of steel, with joints electrically welded, being composed of steel plates and angles. The drum is of steel tubing, grooved to take the full length of cable.

All gears and pinions are of steel, operating on Hyatt roller bearings. The trolley is built with drop forged hangers and pressed steel wheels, operating on roller bearings larger than those for the gears. Being built of steel throughout, the hoist is of light weight and is said to have a large factor of safety.

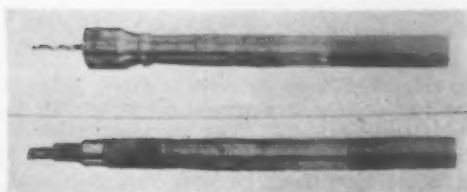
Accessibility for repairs and adjustments is stressed. The swivel arrangement of trolley allows the hoist to travel easily around curves of short radius. It can be adjusted also to various sizes of I-beams. The gears run in an oil bath, the pan being shown at the right in the illustration. There is a 2-in. strap brake, this extra width permitting quick stopping.

Screw-Driver and Drill Chuck for Flexible Shaft Drive

A screw-driver handpiece and drill chuck for use in connection with flexible shaft equipment have added to the line of the Stow Mfg. Co., Binghamton, N. Y.



The Drill Chuck and Screw Driver and the Combination Double-Head Drive Arrangement Are Shown in Lower and Upper Illustrations, Respectively

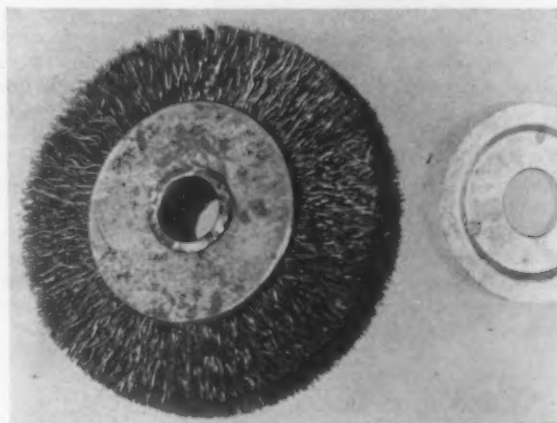


The equipment may be arranged for belt drive from a line shaft, or from a motor to a single head or the combination double head shown in the accompanying illustration. The drive unit may be of suspended or floor types, both of which are counterbalanced, leaving no weight in the hands of the operator. The screw-driver is equipped with a short bit and is of clutch type, relieving itself when the screw is driven home. The clutch is adjustable to permit of driving screws to a predetermined tension. A sliding sleeve is available for centering wood screws. The tool is of simple design and is at present built in two sizes, one of which, the No. 3, has capacity for 2 x 14 in. screws, the No. 4 tool being for larger screws.

Circular Brush for Use Singly or in Gangs

Balance and facility of assembling single units to form wide-faced brushes are features claimed for the circular brush illustrated, which has been placed on the market by the Specialty Mfg. Co., Cleveland.

The construction of the brush may be noted from the accompanying sectional view. A pair of circular galvanized sheet metal stampings, provided with inwardly turned projections or teeth, hold the brush material on either side. The tufts of bristle, wire, fiber or other material are weighed accurately so that each tuft of the brush will be of equal balance and weight. Each tuft is then bent into Vee form and inserted between the successive teeth. A few turns of binding wire are then passed completely around the inside of the Vee, thus drawing the tufts tightly down into position between the stampings. Finally, the stampings are closed down on each other; and the



Balance and Ease of Assembling into Gangs Where Wide-Faced Brushes Are Required Are Features

teeth, passing through the openings in the opposite stamping, are clinched over under heavy pressure, compressing the brush material solidly together. It is then trimmed by a special process to make a true circle.

Advantages claimed include the following: "In consequence of the accurate weighing and spacing of the tufts, the working surface of the brush is equally dense at all points of the circumference. In this manner balance is obtained even at high speeds."

Single-thickness units may be made up in gangs to form wide-faced brushes. These gangs may be assembled either from separate units held in place by the pressure of the shaft end-washers; or may be clinched together by the teeth of the stampings themselves, or secured by transverse rods passing through the entire gang of units by means of holes provided in a central reducer disk. The latter methods are considered preferable in cases where considerable pressure is brought to bear on the revolving brush surface. It is stated that when thus assembled in gangs the units will pack together closely, and the increased density of the working surface obtained is conducive to longer wear and a more even finish on the work.

The brush may be mounted on a polishing spindle of smaller diameter by a special reducer stamping.

European Price Reductions Continue

French May Adopt Export Bounties—New Blast Furnaces in France and Germany
—German December Steel Output a Record—Shipyards Busy

(By Cable)

LONDON, ENGLAND, Feb. 7.

THE pig iron situation is unchanged, with prompt supplies of Cleveland iron scarce, as most of the 46 furnaces in blast are still supplying the steel works. Hematite supplies are short and increased output is entirely dependent upon fuel costs. Foreign ore continues quiet, but deliveries on old contracts are absorbed regularly.

Finished iron and steel production is increasing. Manufacturers are making good deliveries on old contracts, but consumers are slow to place new business and mills are not actively seeking orders. The Clyde ship building output in January was one vessel of 5209 tons.

The tin plate market is quiet with consumers still refraining from forward commitments. Prices are easier as a result of lower priced foreign steel. Continental tin plate bars are being offered at £5 5s. per ton (\$25.46), delivered to Welsh works.

Galvanized sheets are steady. Indian consumers

have bought about 20,000 tons of No. 24 gage galvanized, corrugated sheets in bundles, and larger makers are now fully sold to the end of February. Black sheets continue quiet.

Weakness in Continental markets continues as a result of the slackness in buying. Mills are in need of tonnage and competition is keen. Basic pig iron has sold at £3 8s. (\$16.49) per ton, f.o.b., and billets at £4 10s. (\$21.82) per ton, f.o.b. Wire rods have been reduced to £5 15s. (\$27.88) per ton, f.o.b. for United Kingdom orders. In other markets £5 13s. 6d. (\$27.52) per ton f.o.b. is reported to have been accepted.

The Societe des Hauts Fourneaux de Saulnes (Jean Raty & Co.), France, is building a seventh blast furnace, which is expected to be ready by May. The Lothringen Huetten und Bergwerksverein A. G., Hannover, Germany, is to build a blast furnace and steel plant at Blankenburg. Friedrich Krupp & Co. are finally closing the plant of the Kruppsche Verwaltung der Saynerhuetten in the Rheinland.

GERMAN MERGERS CONTINUE

An Alloy Steel Corporation—Steel Output Exceeds Ratings—French May Pay Export Bounties

BERLIN, GERMANY, Jan. 19.—The movement toward merging various German mills into large corporations continues, despite doubt expressed in some quarters as to the efficiency of such large organizations. One reason given by the Krupp interests for not joining in any of the recent or projected mergers is the doubt that the new corporations will justify themselves. Reports, however, continue to accumulate of economies in the production of iron, steel and coal, as a result of more profitable operation by large units.

The Deutsche Edelstahlwerke A. G., the merger of producers of special and alloy steels, has finally been completed. It includes the Crefelder Stahlwerke,

Bergische Stahlindustrie, Remscheid, the Glockenstahlwerke, Remscheid and three smaller companies, with the Vereinigte Stahlwerke, the largest member of the new corporation. On the board of control are Fritz Thyssen, Dr. Albert Voegler, Privy Councillor Kloeckner and other leaders of the German steel industry. Although operating as a separate corporation, it is in reality a subsidiary of the Vereinigte Stahlwerke.

Meeting of Raw Steel Cartel

A meeting of the International Raw Steel Cartel will be held in Paris this month for the purpose of formally admitting to membership, Austria, Hungary and Czechoslovakia and to consider the offers of other steel producing countries. Poland now seems likely to join the cartel, as the Polish East-Silesian works have finally joined the Polish Steel Syndicate, bringing the industry into a unit, with which it will be possible to negotiate. The Polish mills, however, are expected to

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.85 per £ as follows:

Durham coke, f.o.b.	£1 2s.		\$6.06
Bilbao Rubio ore†	1 2	to £1 2½s.	5.33 to \$5.45
Cleveland No. 1 fdy. (nom.)	4 5		20.61*
Cleveland No. 3 fdy.	4 2½		20.00*
Cleveland No. 4 fdy.	4 1½		19.76*
Cleveland No. 4 forge	4 1		19.64*
Cleveland basic (nom.)	3 15	to 3 15½	18.18 to 18.30
East Coast mixed	4 10	to 4 11	21.82 to 22.06
East Coast hematite	4 8	to 4 12½	21.34 to 22.43
Rails, 60 lb. and up	7 15	to 8 0	37.58 to 38.80
Billets	7 0	to 7 5	33.95 to 35.16
Ferromanganese	16 0		77.60
Ferromanganese (export)	15 15		76.38
Sheet and tin plate bars, Welsh	6 5	to 6 15	30.31 to 32.73
Tin plate, base box	0 19½	to 1 0¼	4.78 to 4.91
Black sheets, Japanese specifications	15 0	to 15 10	72.75 to 75.17
Ship plates	8 10		C. per Lb.
Boiler plates	10 15	to 11 5	1.84
Tees	8 15	to 9 5	2.32 to 2.43
Channels	8 0	to 8 10	1.89 to 2.00
Beams	7 15	to 8 5	1.73 to 1.84
Round bars, ¾ to 3 in.	8 5	to 8 15	1.67 to 1.78
Steel hoops	10 10	and 11 0	1.78 to 1.89
Black sheets, 24 gage	12 0	to 12 5	2.25 and 2.39
Galv. sheets, 24 gage	15 5	to 15 10	2.60 to 2.65
Cold rolled steel strip, 20 gage, nom.	18 0		3.30 to 3.35
			3.91

*Export price, 6d. (12c.) per ton higher.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports (Per Metric Ton)

Foundry pig iron (a)			
Belgium	£3 13s.	to £3 18s.	\$17.70 to \$18.90
France	2 13	to 3 18	17.70 to 18.90
Luxemburg	3 13	to 3 18	17.70 to 18.90
Basic pig iron:			
Belgium	3 8		16.49
France	3 8		16.49
Luxemburg	3 8		16.49
Coke	0 18		4.37
Billets:			
Belgium	4 10		21.82
France	4 10		21.82
Merchant bars:			C. per Lb.
Belgium	4 17½		1.07
Luxemburg	4 17½		1.07
France	4 17½		1.07
Joints (beams):			
Belgium	5 0		1.10
Luxemburg	5 0		1.10
France	5 0		1.10
Angles:			
Belgium	5 4		1.14
½-in. plates:			
Belgium (nominal)	6 11		1.44
Germany (nominal)	6 11		1.44
¾-in. ship plates:			
Belgium	6 1		1.32
Luxemburg	6 1		1.32
Sheets, heavy:			
Belgium	6 3	to 6 4	1.33 to 1.34
Germany	6 3	to 6 4	1.33 to 1.34

(a) Nominal.

demand that the cartel quota be based upon the entire 1926 production of Poland, instead of the output in the first quarter, which was low.

More Agreements In Wire Field

Makers of wire rods in France have decided to join the loose price agreement to which German, Belgian, and Luxemburg mills have adhered for some time. This contract is similar to the existing pig iron agreement, which includes Belgium, France and Luxemburg. The formation of syndicates in the German wire industry is continuing. There are six syndicates among such producers, including wire, wire rods, wire cable and other wire products. Recently another syndicate, the Versatzdrahtverband with headquarters at Essen, has been formed.

The Pig Iron Syndicate has announced unchanged prices and selling conditions for February. Both domestic and export demand for pig iron has declined recently. It is reported that the French pig iron syndicate intends reducing its present domestic price of 540 fr. per metric ton by 40 fr. The German output of pig iron in December was 1,064,791 metric tons, compared with 717,611 metric tons in December, 1925. The year's production was, however, smaller than in 1925, 9,643,519 tons compared with 10,176,699 tons in the previous year.

Steel Output Breaks Records

The steel production of companies in western Germany is reported to have broken all records in December. As a result, the Raw Steel Syndicate's rationing of production at 80 per cent has been abandoned. Many works exceeded their 80 per cent quota. The December output of the Krupp works based on rated capacity was 117 per cent, the Mannesmann Tube Co., on the basis of rated capacity, produced 113 per cent, the Upper Silesian Steel Works, 109 per cent, the United Steel Works, 114 per cent and the Rheinstahl, 117 per cent of rated capacity. With the steel syndicate no longer regulating production, on the ground that control of output by the steel cartel is sufficient, the future course of production is uncertain.

The rated capacity of mills is the basis of the steel syndicate's rationing but the actual productive capacity of all German works is probably from 2,000,000 to 3,000,000 tons per year more than was assumed at the time of the formation of the syndicate.

French May Adopt Bounty Plan

The competition from low exchange countries by what is generally termed "exchange dumping" seems to be at an end. The French price index for December shows that imported products were cheaper than domestically produced material. The French ability to compete with German sellers in foreign markets, therefore, seems to be in question. In France, manufacturers of raw and semi-finished materials are planning to emulate the German bounty system. This entails the furnishing of raw materials to manufacturers producing for export, at special prices under the current domestic market. The present French rebate on foundry iron, which is to be further manufactured for export, is understood to be about 70 fr. per metric ton.

The annual report of Friedrich Krupp A. G. for 1926 is relatively satisfactory, showing an increase in the gross profits of about 1,000,000 marks. The Essen Cast Steel Works, which is the original company in the Krupp organization, is in need of reorganization and extension and the Krupp interests have applied for a government long-term credit of 20,000,000 marks. Their locomotive and car construction plants, however, have insufficient orders and the Krupp works has abandoned the manufacture of textile machinery as a result of the failure of negotiations for large orders from Russia. Russia is reported to have offered 100,000,000 marks for complete transfer to Russian territory of the Rheinmetall's locomotive works.

Numerous Russian orders, under the German 300,000,000 mark export credit, are reported. To the end of 1926, Russia had placed orders under this plan for materials to the value of 151,000,000 marks. The Mannesmann Tube Works is reported to have received an order from Brazil for 8000 tons of tubes. Rumania

has awarded 40,000,000 marks worth of railroad permanent way material to the Stahlwerksverband, to be booked to reparations account. In Yugoslavia, the cabinet has agreed to the plan to award Germany the order for the new Danube River bridge, which will be the largest in Europe, about 9 miles long, and cost 21,990,628 marks, about 17,000,000 marks coming from reparations account. Construction is expected to require four years. The work is to be done by a syndicate of German bridge builders, working with the Siemens Bau-Verein.

GERMAN INDUSTRY ACTIVE

Car, Locomotive and Shipbuilding—Sheet and Plate Mills on Full Schedule

HAMBURG, GERMANY, Jan. 20.—German car builders have booked more business since the first of the year than ever before in a similar period. The German railroads, after practically no purchasing for almost a year, have placed large contracts with several builders and a few makers have booked about 1000 cars from the French railroads. Other orders have included about 3000 cars from the Near East, total bookings being sufficient to carry most car builders through March at full operation. In the first week of January, 25 large locomotives were placed with three builders by South African railroads and Russian orders for locomotives and railroad equipment have totaled more than 4,000,000 marks. Orders from Chile, Argentina and Venezuela have brought another 1000 cars to makers' books.

Rolling mills producing sheets and plates are operating on a full 24-hr. schedule and the last two sheet mills in Siegerland, those of the Neunkirchner Werke in the Saar, went into operation Jan. 20. Every sheet and plate mill in Germany, except a few obsolescent units, is operating, and output is rapidly nearing a record. The shipbuilders are well occupied with contracts for shipping requirements from Italy, and sheet and plate mills have been booking orders from shipyards in Sweden and Norway. It is stated from Russia that the government has decided, following negotiation, to order the construction of 10 vessels in Germany. The Hamburg-American Line has decided to build eight 9000-ton ships at a total cost of about 50,000,000 marks. The Nord Deutsche Line recently placed contracts for the construction of two 46,000-ton fast ships for the New York transatlantic service.

Increasing Factory Wages

Weekly earnings in factories in New York State through 1926 averaged \$29.02. This is much the highest yearly average of the weekly earnings figures ever recorded. It compares with \$28.26 in 1925 and with \$28.15 in 1920, which was the highest prior to 1925. December, 1926, with \$29.47, was the highest average month of all, having displaced the previous high record of \$29.35 in October. The lowest month of 1926 was February, with \$28.61 per week. It is significant that only seven months in the years prior to 1926 showed an average as high as the lowest month of that year.

Two contracts, one for four 33,333 kva. transformers and one for seven 25,000 kva. transformers for the Southern California Edison Co. have been placed with the Westinghouse Electric & Mfg. Co. They will be manufactured at the Sharon works for delivery in the coming spring and summer. Each transformer, completely set up, will weigh more than 100 tons.

Extension for one year has been granted by the Shipping Board to Henry Ford for breaking up and scrapping the 199 steel cargo vessels purchased from the board in 1925. Of this number, 50 vessels are at Norfolk. Mr. Ford asked for added time in which to destroy the ships because of the difficulty in towing them to Detroit.

1926 Machinery Exports Up 4 Per Cent

Total Exceeded \$400,000,000—Imports Heavier at \$17,137,056

—Agricultural Machinery Exports
Set New Record

WASHINGTON, Feb. 5.—Making a gain of nearly \$15,000,000, exports of machinery in the calendar year 1926 aggregated a value of \$400,167,883, as against \$385,376,676 in 1925. Exports in December, 1926, amounting to \$32,140,569, showed a decline of nearly \$6,000,000 under December, 1925, when the total was \$37,933,511, and also a slight decline under November, 1926, with a total of \$32,694,793. Exports of industrial machinery as classified by the Division of Statistics, Department of Commerce, for 1926 were valued at \$179,669,196, as compared with \$172,911,903 in 1925. Industrial machinery exports in December, 1926, were valued at \$15,484,221, compared with \$16,501,451 in December, 1925.

Exports of power-driven metal-working machinery in 1926 were valued at \$14,315,695 as against \$17,798,464 in 1925, while in December, 1926, the value was \$1,202,069, as against \$1,642,274 in December, 1925. Exports of other metal-working machinery in 1926 were valued at \$4,652,444, as against \$4,238,332 in 1925. For December, 1926, the value of exports of this class of equipment was \$377,344, as against \$349,698 in December, 1925. Exports of power-driven metal-working machinery in December, 1926, included 416 machines of the classes in one list, with a value of \$661,072, as against 443, valued at \$608,593, in November, 1926.

Imports of machinery classified in THE IRON AGE table in 1926, with a value of \$17,137,056, showed a sharp increase over 1925 when the value of these im-

ports was \$11,577,911. Imports in December, 1926, were valued at \$1,373,234, as against \$1,210,868 in November, 1926, and \$1,448,316 in December, 1925.

Imports of industrial machinery in 1926 showed a heavy gain over similar imports for 1925, the respective totals being \$16,450,043 and \$11,709,478. In December, 1926, industrial machinery imports were valued at \$1,438,565, as against \$1,433,396. A striking item of imports in December of last year concerned metal-working machine tools, whose value rose to \$101,073, or more than one-fifth of the total value of this class of imports for the entire year 1926, which was \$492,670. The increase in December was due to imports of small tools from Germany received through the port of Norfolk, Va.

Of the 17 steam locomotives valued at \$275,549 exported in December, 1926, Canada took five, valued at \$50,648, while Mexico took four, valued at \$49,475. Of the 271 locomotives, valued at \$5,113,406, exported last year, Brazil took 53, valued at \$1,339,115; Canada, 54, valued at \$659,262; Mexico, 19, valued at \$156,460, and Central America, 19, valued at \$357,994.

Of the 20,643 sewing machines, valued at \$737,439, exported last December, 4339, valued at \$342,480, were for factory or industrial use. For the year 1926 the total number of sewing machines exported was 257,587, with a value of \$8,683,107, of which 42,538, valued at \$3,123,420, were for factory or industrial use. Distribution of these machines in December and for the year

Machinery Exports from the United States
(By Value)

	December, 1926	December, 1925	Twelve Months Ended December, 1926	Twelve Months Ended December, 1925
Locomotives.....	\$275,549	\$712,860	\$5,113,406	\$7,022,123
Other Steam Engines.....	43,784	262,426	1,305,697	1,071,518
Boilers.....	174,851	118,131	1,804,677	1,920,736
Turbines and Parts.....	198,159	148,037	1,908,622	2,087,002
Automobile Engines.....	326,817	978,080	12,522,189	15,273,952
Other Internal Combustion Engines.....	645,123	640,376	9,129,569	9,190,786
Accessories and Parts.....	315,541	352,941	4,273,298	4,110,699
Electric Locomotives.....	128,957	126,786	2,068,422	811,321
Other Electric Machinery and Apparatus.....	666,412	575,627	7,422,890	6,882,648
Excavating Machinery.....	391,864	218,607	4,504,932	3,124,937
Concrete Mixers.....	42,994	94,611	734,124	807,464
Road-Making Machinery.....	55,816	136,432	1,685,492	1,430,036
Elevators and Elevator Ma- chinery.....	409,852	151,392	5,194,750	1,963,476
Mining and Quarrying Ma- chinery.....	1,103,160	1,092,046	14,857,106	10,562,087
Oil-Well Machinery.....	1,374,535	1,319,028	15,303,058	10,249,069
Pumps.....	607,336	755,005	6,169,150	7,593,499
Lathes.....	79,289	314,305	960,892	2,584,504
Boring and Drilling Machines.....	118,000	43,712	862,956	629,301
Planers, Shapers and Slotters.....	13,680	30,014	314,512	563,633
Bending and Power Presses.....	29,040	58,508	1,298,610	594,916
Gear Cutters.....	42,094	22,824	418,074	816,576
Milling Machines.....	67,817	108,036	959,058	1,630,611
Thread-Cutting and Screw Machines.....	90,727	100,579	726,990	1,192,596
Forging Machinery.....	67,711	27,704	1,058,938	248,092
Rolling Machinery.....	46,944	505,196	402,315	1,430,086
Sharpening and Grinding Ma- chines.....	229,839	244,917	2,062,856	3,075,140
Other Metal-Working Ma- chinery and Parts.....	377,344	616,712	4,652,448	5,581,944
Textile Machinery.....	1,046,632	1,394,533	10,400,268	11,488,900
Sewing Machines.....	737,439	837,545	8,683,107	8,743,670
Shoe Machinery.....	126,378	134,699	1,353,210	1,370,142
Flour-Mill and Gristmill Ma- chinery.....	70,972	88,502	862,656	880,105
Sugar-mill Machinery.....	330,697	694,740	4,042,626	8,270,021
Paper and Pulp-Mill Machinery.....	477,437	234,166	3,846,109	1,717,451
Sawmill Machinery.....	65,794	107,396	966,020	823,336
Other Woodworking Machinery.....	77,653	97,276	1,300,112	1,347,871
Refrigerating and Ice-Making Machinery.....	470,459	347,851	5,058,610	2,485,291
Air Compressors.....	315,100	326,100	4,665,425	3,886,090
Typewriters.....	1,682,775	1,820,654	16,230,165	18,020,494
Power Laundry Machines.....	33,988	118,200	1,310,430	966,335
Typesetting Machines.....	393,272	357,815	3,741,228	3,446,955
Printing Presses.....	519,798	641,460	6,232,261	4,798,261
Agricultural Machinery and Implementations.....	4,965,941	7,448,080	55,966,573	77,565,153
All Other Machinery and Parts.....	12,866,129	13,515,843	135,371,040	147,000,460
Total.....	\$32,140,569	\$37,933,511	\$400,167,883	\$385,376,676

Imports of Machinery into the United States

	December		Twelve Months Ended December	
	1926	1925	1926	1925
Metal - working machine tools.....	\$101,073	\$25,803	\$492,670	\$373,575
Agricultural ma- chinery and im- plementations.....	336,122	322,655	5,011,804	3,094,104
Electrical ma- chinery and ap- paratus.....	77,263	73,835	844,551	938,726
Other power- generating ma- chinery.....	735	1,908	76,202	15,427
Other machinery.....	655,720	848,344	8,481,839	5,216,626
Vehicles, except agricultural ..	202,321	175,271	2,229,990	1,929,453
Total.....	\$1,373,234	\$1,448,316	\$17,137,056	\$11,577,911

Exports of Power-Driven Metal-Working Machinery

	December, 1926		November, 1926	
	No.	Value	No.	Value
Engine lathes.....	32	\$56,890	27	\$96,849
Turret lathes.....	17	22,399	20	65,152
Other lathes.....	47	54,878	40	33,850
Vertical boring mills and chucking ma- chines.....	17	54,067	2	1,729
Thread - cutting and automatic screw ma- chines.....	81	90,727	81	97,162
Knee and column-type milling machines....	15	25,751	27	56,803
Other milling machines.....	28	42,066	11	16,959
Gear-cutting machines.....	10	42,094	14	8,724
Vertical drilling ma- chines.....	9	24,707	34	22,182
Radial drilling machines.....	6	18,655	1	765
Sensitive drilling ma- chines.....	5	2,463	9	4,304
Other drilling machines.....	25	28,108	24	26,156
Shapers and slotters....	11	11,485	26	29,961
Planers.....	3	2,195	..	..
External cylindrical grinding machines....	43	105,532	42	75,632
Internal grinding ma- chines.....	20	50,282	34	40,787
Metal-working tool- sharpening machines.....	47	28,773	40	31,578
Total.....	416	\$661,072	443	\$608,593

1926, respectively, among the more important countries were as follows: United Kingdom, 2391, valued at \$162,253; 19,940, valued at \$1,141,319; Mexico, 1767, valued at \$42,283; 41,852, valued at \$1,431,523; Argentina, 1025, valued at \$35,388; 5830, valued at \$260,040; Brazil, 1376, valued at \$43,181; 13,328, valued at \$487,071; Cuba, 613, valued at \$15,933; 16,891, valued at

United States Exports and Imports of Machinery

	Exports of Machinery	Imports of Machinery	Exports of Metal-Working Machinery
The year 1924...	\$317,040,424	\$9,711,618	\$8,644,444
1925			
January	28,117,952	803,829	845,986
February	23,215,776	814,703	707,445
March	33,932,473	999,237	1,364,930
April	33,468,086	1,167,099	1,694,761
May	32,164,865	861,655	1,230,914
June	27,121,123	935,487	1,003,325
Fiscal year.....	325,578,294	10,404,337	14,011,404
July	32,320,533	905,872	1,188,069
August	38,768,823	747,912	1,308,372
September	30,719,342	956,250	989,379
October	31,271,007	996,557	905,826
November	30,084,814	876,113	1,007,376
December	37,933,511	1,448,316	1,155,660
The year 1925....	385,376,676	11,577,911	13,052,916
1926			
January	34,590,693	1,659,971	853,276
February	32,269,707	1,469,170	1,294,934
March	35,241,960	1,567,912	1,297,616
April	38,755,467	1,814,021	1,479,337
May	32,707,863	1,494,156	1,004,298
June	30,498,054	1,484,127	1,024,252
Fiscal year.....	398,306,436	15,413,144	16,046,267
July	34,123,992	1,327,874	1,318,556
August	32,459,844	1,453,909	1,326,443
September	36,901,003	1,432,378	1,145,406
October	27,965,148	1,247,115	1,069,343
November	32,694,793	1,210,868	1,274,446
December	32,140,569	1,373,234	1,202,069
The year 1926....	400,167,883	17,137,056	14,315,695

\$468,669; Canada, 907, valued at \$34,288; 9763, valued at \$428,632.

American typewriters to the value of \$1,682,775 were exported in December, 1926, while for the entire year 1926 the value was \$18,220,165. Distribution of these exports by the more important countries of distribution for December and for 1926, respectively, were as follows: United Kingdom, 6499, valued at \$369,381; 54,108, valued at \$2,980,159; France, 2024, valued at \$101,445; 34,763, valued at \$1,835,551; Germany, 1398, valued at \$91,953; 13,872, valued at \$705,067; Australia, 1336, valued at \$70,809; 13,838, valued at \$810,000; Czechoslovakia, 1230, valued at \$66,878; 8394, valued at \$456,648; Canada, 1153, valued at \$66,720; 14,026, valued at \$807,566.

EXPORT BUSINESS SMALL

Japanese Want Oil Well Material—Machine Tools for New Zealand

NEW YORK, Feb. 8.—Export business continues light, with South American trade confined to purchases of small lots and Far Eastern business quiet as a result of the revolution in China and the burial of the Emperor of Japan. Inquiries from Japan include 28,300 ft. of black gas pipe and 70 tons of 60 and 70-lb. tie plates for the Imperial Government Railways. The Northern Karafuto Oil Co. in Japan is in the market for a small lot of oil-well casing and tubing. One large Japanese export house recently placed 120 tons of light gage black sheets with an American mill. Prices on light gage sheets for Japan continue at \$82 to \$83 per ton, c.i.f. port, but it is believed by buyers that a firm offer on a sizable lot would probably bring out a slightly lower price. There are a few small Japanese inquiries for tin plate in the market.

Importers in New York report but little current business. Most of the purchasing at present is confined to small lots of bars, structural material and a few hoops. Continental prices continue to settle to lower levels and recent quotations have been about 1.75c. to 1.80c. per lb. for plain bars, 1.65c. to 1.75c. per lb. base for shapes and 2.25c. to 2.30c. per lb. for hot-rolled hoops, all c.i.f. duty paid.

A notable number of machine tool builders in the United States appeared as low bidders on a recent list including more than 110 items, inquired for by the New Zealand Government Railways. Other bidders were largely British and Canadian. Of the American companies which were low, the Landis Machine Tool Co., quoted on a screw machine; Gisholt Machine Co., on a pin hole and radius link grinder; Bullard Machine Tool Co., on three vertical boring mills; the Ajax Machine Co., on a 3-in. forging machine; Monarch Machine Tool Co., on tool room lathes; Cincinnati Shaper Co., on a shaping machine; Atlas Engineering Co., four spindle cock grinders and a tapping machine; Cincinnati Engineering Co., tool-post grinders; Joseph T. Ryerson & Sons, oil furnaces and an elliptic spring forming machine, and the Mahr Mfg. Co., a fuel oil rivet furnace.

A racing shell of duralumin has been made at the Naval Aircraft Factory in Philadelphia, which is said to weigh about one-half as much as the ordinary cedar construction. This experimental craft is for the use of one man. It is understood that, if it proves satisfactory, the Naval Academy will have an 8-oared shell built of this material.



HOW Tin Cans Are Utilized as a Building Material in the Near East. The accompanying photograph shows a boy, trained in carpentry and tinsmithing at a Near East Relief orphanage, building a shack in a camp near Beirut, Syria. His material consists largely of Standard Oil tins beaten into sheets which are used both as roofing and siding

Metal-Working Machinery in 1925

Census Figures Show \$175,592,488 of Product
—Details of Types, Numbers and
Values of Machines

WASHINGTON, Feb. 4.—Metal-working machinery to the value of \$117,891,697 was produced in 1925, according to preliminary statistics of the Bureau of Census obtained from 378 establishments engaged primarily in this line of output. Parts and attachments produced were valued at \$32,603,289, while all other products, including amounts received for contract work and repairs, were valued at \$25,097,502. The total value of production of metal-working machinery, parts and relative products, therefore, was \$175,592,488.

Because of changes in classification the 1925 figures are not comparable with the total value given for 1923, the previous census year. The bureau has included the value of rolling mill, sheet-metal work, welding, wire-drawing and wire-working machinery manufactured in 1925 in the amount shown for that year. This cannot be shown for 1923, because establishments manufacturing these products were classified in the Foundry and Machine Shop Products at the 1923 census.

The largest individual item reported for 1925 covered production of 5165 engine lathes, valued at \$7,675,897, compared with 7295 units in 1923, valued at \$8,884,904. Next came 5002 power presses for

sheet-metal work, with a value of \$5,108,103, which was a substantial decline from the production of this equipment in 1923, when the number was 5730, valued at \$5,465,626. There was a decline in 1925 in the production of other important units, also, including all classes of lathes, multiple-spindle and radial stationary drilling machines and certain classes of milling machines. On the other hand, there were increases in the production of horizontal boring machines, sensitive drilling machines, gear-cutting machines, grinding machines and screw machines.

Of the 378 establishments reporting, 93 were located in Ohio, 37 in Connecticut, 36 in Massachusetts, 34 in Michigan, 33 in Illinois, 30 in Pennsylvania, 26 in New York, 20 in Wisconsin, 12 in Indiana, 12 in New Jersey, 8 in Rhode Island, 6 in Vermont, 5 each in California, Kentucky, Minnesota and New Hampshire, 4 in Missouri, 3 in Maryland, and 1 each in Colorado, Delaware, Iowa and Nebraska.

Wage earners in 1925 averaged 36,325, with payrolls aggregating \$55,931,810, or an average of \$1,539 per man. The value added by manufacturing operations on \$54,524,362 of materials was \$121,068,126.

Metal-Working Machinery—Production by Kind, Number and Value: 1925 and 1923

	1925		1923			1925		1923	
	Total Number	Value	Total Number	Value		Total Number	Value	Total Number	Value
Total value..	.....	\$175,592,488	.....	(a)	Lathes:				
Bending machines..	807	\$641,711	616	\$616,443	Engine	5,165	\$7,675,897	7,295	\$8,884,904
Boring machines:					Bench	930	397,627	950	462,122
Horizontal	581	1,683,924	477	1,231,584	Turret (including				
Vertical	219	1,344,137	326	2,345,772	hand-screw machines)	1,567	4,155,054	2,544	5,320,087
Broaching machines	435	540,093	235	347,317	Other	(a)	4,090,746	1,197	4,323,371
Cutting-off machines:					Milling machines:				
Rotary-cutter type	250	294,168	299	404,467	Hand feed	450	207,855	274	93,794
Hacksaw type...	1,499	197,463	652	207,873	Power feed—				
Drilling machines					Plain	723	1,624,617	1,063	1,881,709
(stationary):					Universal	599	1,360,884	453	959,967
Multiple - spindle					Vertical	323	860,080	328	770,541
(including gang					Lincoln type...	374	679,101	194	438,950
drills)	1,211	2,109,738	(a)	(a)	Planer type...	121	1,022,037	56	672,969
Radial	830	2,038,392	922	2,431,269	Other	202	534,261	538	1,229,295
Sensitive	3,577	1,776,238	2,612	1,228,456	Planers	193	1,104,786	302	2,110,093
Vertical (upright)	2,256	998,234	2,506	1,048,781	Pipe-cutting and				
Forging machines:					threading machines	2,624	1,298,459	1,953	1,002,497
Bolt, nut and rivet	18	219,810	24	100,885	Presses:				
Buildozers and					Hydraulic—				
other	65	541,610	96	711,992	Bending and				
Gear-cutting					forming	1,015	1,592,075	501	553,839
machines:					Forging	28	81,247	274	124,355
Generator, hobbing					Power, for sheet-				
type	647	2,025,735	1,107	3,506,206	metal work ...	5,002	5,108,103	5,730	5,465,626
Formed and disk-					Punching machines				
cutter types, and					(stationary) ..	1,018	1,879,206	1,390	1,119,302
other	624	2,232,615			Riveting machines				
Grinding machines:					(stationary) ..	1,337	473,591	1,947	668,218
Cylindrical—					Screw machines,				
Plain	(a)	3,136,075	(a)	2,580,767	automatic:				
Universal	330	508,500			Multiple-spindle .	1,140	3,971,721	954	2,832,781
Surface	894	1,466,760	1,034	2,122,134	Single-spindle ...	1,161	1,947,545	1,159	2,006,958
Cutter, tool, and					Shapers	1,125	1,614,760	1,569	2,052,305
knife	1,501	1,716,744	938	1,052,843	Shears (power) ...	1,887	1,347,940	1,763	980,639
Internal	765	2,005,278	515	888,620	Sloters	62	404,968	81	446,368
Other	1,346	1,501,820	(a)	1,137,318	Threading machines				
Hammers					(except for				
(stationary):					pipe):				
Drop	201	407,608	122	164,220	Die type	153	171,127	162	277,515
Steam or air, and					Milling type	81	344,106	115	371,968
other power					Tapping machines				
(belt or motor-					and rolling type	336	323,287	580	439,427
driven)	654	421,850	534	376,322	All other metal-				
					working machinery	(b) 45,812,114	.....	(a)	
(a) Data incomplete or not comparable.					Parts and attach-				
(b) Rolling-mill, sheet-metal working, welding, wire-					ments	32,603,289	.....	25,460,514	
drawing, and wire-working machinery; power-driven motor					All other products..	21,205,421	.....	8,571,124	
tools, other than electrically-driven portable tools made by					Amount received				
establishments engaged chiefly in the manufacture of electrical					for contract				
machinery, apparatus, and supplies; and other metal-					work and re-				
working machinery, not specified above.					pairs	3,892,081	.....	

Industrial Use of Fuel Oil

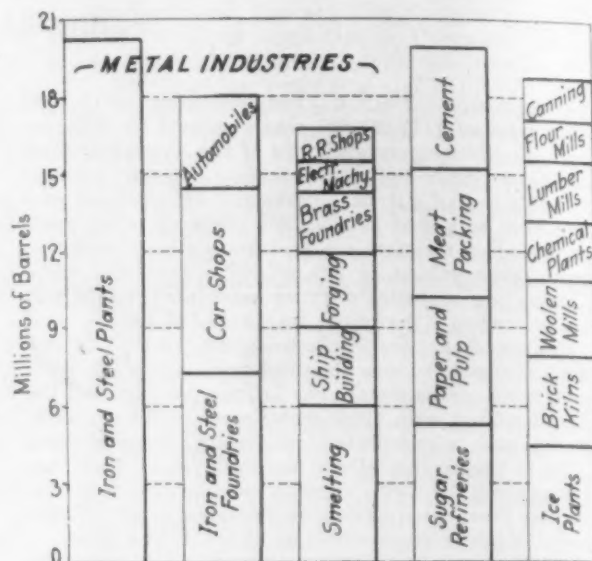
One-Half of Total Used by Manufacturing Plants—Aggregate 1,100,000 Bbl. Daily

ABOUT 200,000,000 bbl. of the 400,000,000 bbl. of American fuel oil marketed is consumed by industry. Manufacturing, according to an article in *Fuel Oil*, accounted for 119,277,000 bbl. in 1925. Gas plants, with 23,308,000 bbl.; public utility power plants, with 10,244,000 bbl.; and oil refineries, with 48,000,000 bbl., brought the total industrial consumption to 200,829,000 bbl. Additional major uses included railroads, 59,355,000 bbl.; shipping, 79,173,000 bbl.; United States Navy, 6,300,000 bbl.; domestic heating, 18,240,000 bbl., and exports, 36,120,000 bbl. The aggregate of these figures is 400,017,000 bbl.

Distributed geographically, Pennsylvania, with 26,641,000 bbl., led in industrial consumption, followed by New York, with 20,767,000 bbl., and California, with 19,733,000 bbl. In manufacturing alone, Pennsylvania used 18,329,000 bbl., followed by Ohio, with 11,899,000 bbl.; New York, 11,770,000 bbl.; Illinois, 7,171,000 bbl.; Massachusetts, 6,998,000 bbl.; Michigan, 5,332,000 bbl., and Indiana, 4,962,000 bbl.

Iron and Steel Industry Leads

Distribution of the consumption among the manufacturing industries shows iron and steel in the first rank, with 20,281,000 bbl. Foundries came second, with 7,278,000 bbl.; car shops third, with 7,152,000 bbl.; followed by smelting plants, 5,960,000 bbl.; sugar refineries, 5,181,000 bbl.; paper and pulp, 5,003,000 bbl.; slaughtering and meat packing, 4,949,000 bbl.; cement, 4,768,000 bbl.; ice plants, 4,475,000 bbl.; brick kilns, 3,576,000 bbl.; automobile plants, 3,570,000 bbl.; ship building, 3,101,000 bbl.; and forgings, 2,859,000 bbl. Other industries making smaller use of fuel oil brought



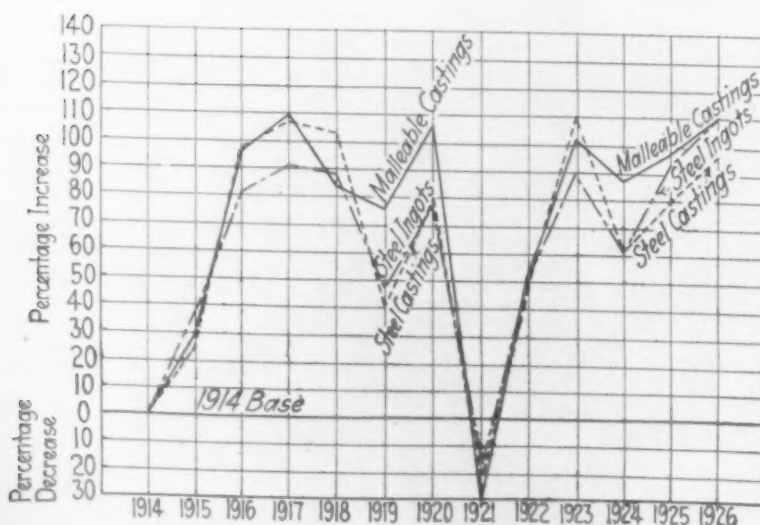
Industrial Consumption of Oil Fuel in 1925 Shows Iron and Steel Plants Leading All Industries. Those listed are the principal users and include all whose consumption exceeded 1,500,000 bbl.

the total to the 119,277,000 bbl. already mentioned.

Growth in domestic demand for fuel oil has been steady, from 132,000,000 bbl. in 1917 to 240,000,000 bbl. in 1922 and 364,000,000 bbl. in 1925. The author of the article (H. J. Struth) sees no reason to fear any shortage in the supply in the immediate future, regardless of the rapidly increasing demand.

Malleable Castings Holding Their Own

Relative to 1914, Malleable Castings Have Kept Up with Steel Ingots and Are Ahead of Steel Castings



Using production of 1914 as a base, the accompanying diagram of output of malleable castings, steel castings and steel ingots has been prepared by the American Malleable Castings Association, Cleveland. It will be noted that 1926 production of all three products was double that of 1914. Over nearly all of the years covered, malleable castings have remained at a higher level in proportion to the 1914 output than steel castings. That fact has been true, particularly for the last three years, in which the divergence, while gradually narrowing, has been somewhat pronounced.

In This Issue

Discovers a method for hardening copper.—By adding a small amount of silicon and a larger amount of chromium, iron, cobalt or nickel, a hard, strong, corrosion-resisting alloy is obtained.—Page 421.

Foundry saves almost half of floor space by installing mechanical sand-handling and reclaiming system.—Manual labor has been entirely eliminated; crane service is not necessary.—Page 413.

Boilers operated by blast furnace gas give best results with a volume of 3 cu. ft. per rated boiler horsepower.—Burners should be located at the low end of boiler, to provide the longest flame travel possible.—Page 419.

Quenches coke without water.—Combustion is stopped by shutting out oxygen, and the hot gases are used to make steam. Thus the heat lost in the water-quenching process is saved. Dry-quenched coke is said to be superior.—Page 425.

New plan for collecting employment statistics is aimed to smooth out production curve.—Manufacturers will be asked to submit monthly report of number of wage-earners and wages paid. Totals will be shown for industries and for districts, to enable each manufacturer or distributor to determine whether he is maintaining his relative position in his field.—Page 428.

Corrosion of rivets is a serious problem in ship maintenance.—Salt water attacks steel rivets quickly, suggesting a possible return to iron, if the cost could be reduced.—Page 429.

City safety council justifies its existence by sharp reduction in accident rate.—In 1922 Worcester's industries had 4 accidents per 100 workers; in 1926 they had been reduced to 2.5.—Page 430.

"Real" earnings, the best index of prosperity, reveal a healthy condition.—November hourly wage rate was higher than at any time during the past two years. "Real" earnings (wages measured by purchasing power) were higher in October, 1926, than at any time since the beginning of 1924.—Page 420.

American output of manganese ore in 1926 was less than half the 1925 production.—Heavy imports have curtailed domestic output, which was only 44,000 gross tons in 1926, as compared with imports of about 703,000 tons during first 11 months.—Page 427.

More than 400 million dollars' worth of American machinery was exported in 1926.—This was a gain of 4 per cent over 1925. With exports valued over 85 million dollars, farm machinery builders set a new record in export sales.—Page 443.

Believes that drop forging buyers' best interests are served by permitting the forge plant making the dies to retain them.—Dies are made to fit the hammers of the first user, and as the shanks of dies are not standardized, changing them to fit the hammers of the second user is likely to injure the dies.—Page 417.

Aluminum-silicon alloys have the lowest shrinkage of any of the aluminum alloys.—Eutectic alloy of about 10.5 per cent silicon is highly resistant to corrosion, has good strength and fair ductility.—Page 422.

The lowest price on the first lot of drop forgings may be the dearest in the long run.—If the forging company quotes too low on the first run, in self-protection it will be forced to quote higher on later runs. The man who buys solely on a "dollar basis" soon discovers that the annoyance and expense incident to rejections counterbalance the expected saving.—Page 418.

Steel output increased sharply in January.—Daily rate of ingot production was 146,419 gross tons, a gain of 9.6 per cent over December, and highest since October.—Page 453.

A business depression is not necessarily a part of the operation of a business cycle.—History reveals that a cycle can occur without there being a panic or even a severe industrial depression. And, conversely, a depression can occur without relation to the operation of a full business cycle.—Page 450.

Immigration is increasing and emigration is declining.—The net increase in population during the last half of last year, due to surplus of immigration over emigration, was 133,176, as compared with 97,556 for last half of 1925.—Page 435.

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Keeping Management Posted

ITEMS of new equipment described in THE IRON AGE last year were in excess of 350, which number does not include those presented in connection with the various machine tool and other exhibitions held during the year. Nor does it account for the equipment descriptions in special articles devoted to shop processes and methods.

In addition to the number of such news items, the variety of the developments reported has been noteworthy, for in this procession are to be found machine shop, foundry, forge, pattern shop, inspection and testing, heat treating, welding, materials handling and other classes of equipment.

All of these numerous developments had as their basis the achievement of definite economies in manufacturing operations, and as such were presented for the information of plant executives, whose responsibilities incline them to alertness in finding and using every feasible means of increasing output and lowering cost.

For News Summary See Reverse Side

Where Steel Exports Went in 1926

Canada Took 833,763 Tons, or 39 Per Cent of Total—Japan Retains Second Position with 260,362 Tons, Followed by Mexico with 100,791 Tons and Cuba with 94,730 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	December		Twelve Months Ended December		December		Twelve Months Ended December		December		Twelve Months Ended December	
	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925
Total	8,866	9,933	138,258	104,450	17,163	12,410	178,636	180,270	19,646	11,387	175,646	92,431
Canada	5,786	8,701	111,295	82,384	1,705	1,751	42,487	24,927	5,023	2,571	65,210	42,613
Japan (a)	39	12	529	928	328	176	5,378	3,982	10,214	6,849	88,796	38,234
Cuba	50	50	1,289	1,245	2,153	981	12,006	11,671	130	18	674	1,083
Philippine Islands	...	...	...	487	2,062	2,103	23,362	18,401	...	21	...	159
Mexico	102	269	1,522	1,560	545	723	9,083	7,524	...	...	...	...
Argentina	...	...	...	...	1,289	493	10,357	35,642	516	20	1,590	767
Chile	...	...	...	...	1,121	351	6,940	2,507	...	...	...	...
Colombia	...	...	...	...	935	921	7,992	3,720	...	...	...	...
<hr/>												
	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	December		Twelve Months Ended December		December		Twelve Months Ended December		December		Twelve Months Ended December	
	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925
Total	19,445	4,820	187,760	151,690	1,591	5,873	50,718	71,115	1,878	2,770	31,311	35,696
Canada	627	171	26,343	20,212	17	92	5,297	1,980	781	858	11,878	13,701
Japan (a)	6,143	221	34,378	10,136	...	...	...	...	111	89	1,335	730
Cuba	3,524	1,973	19,810	37,343	117	391	2,372	4,406	122	140	1,348	2,315
Philippine Islands	152	429	5,181	2,807	13	486	4,761	1,626	...	22	...	916
Mexico	332	505	9,670	5,394	282	469	2,347	5,409	269	535	5,564	1,712
Argentina	...	...	...	...	...	793	2,065	10,038	...	93	2,857	1,355
Chile	552	3	9,270	6,031	...	...	...	...	...	...	...	...
Colombia	5	380	4,964	2,569	355	940	6,301	5,670	...	119	...	239
Brazil	6,020	...	23,467	6,085	32	485	6,357	14,112	...	...	1,229	...
Honduras	...	...	...	1,324	...	...	...	...	...	...	...	...
Australia	...	...	...	...	...	182	...	...	57	218	814	2,496
<hr/>												
	Tin Plate				Steel Bars				Plain and Heavy Structural Material			
	December		Twelve Months Ended December		December		Twelve Months Ended December		December		Twelve Months Ended December	
	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925
Total	31,735	13,001	250,736	161,383	10,952	9,859	137,770	111,948	10,617	9,610	137,121	104,339
Canada	3,639	1,578	46,902	35,751	5,131	5,896	82,741	64,302	3,281	7,450	119,590	73,557
Japan (a)	7,446	2,609	49,062	38,794	67	7	2,173	979	66	...	5,380	992
Cuba	903	391	3,124	4,802	146	204	3,452	5,121	503	540	7,201	18,751
Mexico	771	330	9,299	5,276	195	...	3,412	3,319	...	...	...	...
Argentina	2,517	397	16,573	6,656	118	...	2,830	...	...	...	...	...
Chile	1,230	1,161	7,031	6,720	167	...	2,879	2,614	714	182	6,593	2,074
Brazil	1,277	...	5,868	...	...	...	...	...	...	...	...	...
China	4,764	303	24,178	19,388	...	...	...	...	...	...	...	...
British India	263	1,311	14,591	...	...	...	...	...	...	...	...	...
United Kingdom	...	...	...	...	3,423	...	27,396	...	...	...	...	...
Italy	183	203	10,126	7,730	...	...	...	...	...	...	...	...

(a) Includes Chosen.

NEW SCRAP CLASSIFICATIONS

Bethlehem Steel Co. Announces Changes in Grades It Will Purchase

The Bethlehem Steel Co., one of the largest consumers of scrap in the country, has announced new classifications of iron and steel scrap it will buy. Some of the changes are apt to influence greatly the scrap situation in the East, considering that the Bethlehem company, by reason of its large purchases, dominates the market.

Specifications for No. 1 heavy melting steel remain practically the same as formerly, consisting of material $\frac{1}{4}$ in. or heavier, not over 18 in. wide and 5 ft. long, but a new specification is established which practically conforms to that for No. 2 heavy melting steel adopted by the Division of Simplified Practice, Department of Commerce, in cooperation with producers, distributors and consumers of old material. In this classification the Bethlehem company lists 14 items of automobile scrap, such as frames, rear ends, springs, crankshafts, front axles, rims, propeller shafts, truck wheels, connecting rods, transmission housings, bumpers and brake drums, but excludes such material as disk and wire wheels, top frames, fender material, body sheets, pans, cast iron engine parts, mufflers, exhaust pipes, fans, metal running boards, headlights, radiators and hoods. In this classification the company will also accept clean steel pipe and fittings, free from excessive

corrosion, 4 in. and under in diameter, 12 in. and under in length, with not more than 5 per cent of galvanized material. Steel car sides will also be allowed as No. 2 heavy melting steel if cut not larger than 12 x 18 in. and if not less than $\frac{1}{8}$ in. thick.

Four grades of blast furnace scrap are listed, No. 1 consisting of borings and turnings, for which the full market price will not be paid unless the material analyzes 90 per cent metallic iron. If the delivery shows a lower content than 90 per cent but not below 85 per cent, \$1 per gross ton will be deducted; material found to be below 85 per cent in iron will be rejected or taken in at a further reduction.

No. 2 blast furnace scrap shall consist of steel and iron pipe and fittings, bedstead material, steel and iron tubing, with not more than 5 per cent galvanized material. No. 3 shall consist of brake shoes and pieces of unburned iron or steel not larger than brake shoes. These will be accepted only at Bethlehem, Coatesville and Sparrows Point plants. For Nos. 1, 2 and 3 grades the full market price will be paid, but a No. 4 classification is established, on which there will be a reduction of \$2 a ton, this grade to consist of automobile fenders, top frames, wire and disk wheels, body sheets, cast iron engine parts, mufflers, exhaust pipes, fans, metal running boards, headlights, hoods, pans, etc.; also steel plates and sheets of any description, wire rope, skeleton, etc. All of this material is to be cut not over 8 in. in any dimension, and not over 5 per cent shall be galvanized.

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Trend or Cycle?

DISCUSSION with regard to "the business cycle" has of late run largely to the question whether or not we are in any cycle at all at the present time. Perhaps all the learning that has been displayed in recent years about the cycle is in the nature of a post-mortem, useful, however, as a preventive of the departed's being resuscitated. It has long been clear to some observers that adequate and widespread knowledge of the cycle would prevent it from operating, as men would forestall its movements.

In none of this discussion, so far as we are aware, has one very vital point been emphasized, that a full business cycle (of the general character familiar through the long record of business) can occur without there being a panic, and even without there being a severe industrial depression; also that either of these phenomena or both can occur without there being a regular cycle of the type made familiar by experience and recent studies. Close students may be fully aware of this fact, but the general public, which, after all, takes only a rather superficial interest, does not seem to be. In proof of the claim that there is no tight connection, witness predictions made that the next panic or depression, if there is one, will come from some new cause. How could such a phenomenon be lined up with the cycles of the past?

To illustrate, there are dangers from our course of the past few years in having a large favorable merchandise balance in our foreign trade, and loaning abroad billions of dollars annually. Obviously that is something that cannot continue indefinitely, since capital is always invested for the sake of returns.

The matter of the cycle is complicated by the fact that we have had a great war. Following such an occurrence, as was the case after the Napoleonic wars, with our own war of 1812, also after our Civil War, with the Franco-Prussian War, there is a long period of readjustment and reconstitution, all with influences and results of its own. The period is longer than that of any so-called "regular" business cycle. Then we have

another complication by short swings due to the inclination of the earth's equator to the plane of the ecliptic, producing seasons in the weather, the whole period being that of the earth's revolution around the sun. The typical or average man of business has always been more interested in current trends, their direction and exact amount, than in the long swings.

There can be no such assurance, but suppose it could be given, that the next top or bottom in the cycle is to be at such and such a time in the future. The question would at once be asked, exactly how high or low is it going to be? If that were answered, the question would be "what are you going to do about it?"

With trends the matter is different. One knows what to do. These are matters associated with the daily conduct of one's business. If the price trend is downward, one knows he should endeavor to reduce cost rather than increase capacity. If unemployment is increasing or decreasing, one knows how he should conduct his "hiring and firing."

Trends will now be studied with ever increased interest. The observer will, however, by no means ignore the longer range affairs. He will take the trend as representing a resolution of forces, endeavoring to distinguish the seasonal influence, the cyclical influence and the post-war reconstitution influence.

WONDER has been expressed as to how so much steel, in increasing quantities, is being disposed of. Last year supplied 3,000,000 tons more ingots than 1925, for example, and 1925 itself had furnished a record. The rapidly expanding American population needs to be visualized to secure an explanation. It remained for the National Industrial Conference Board to point out that our gain in population in the past five years was 38 per cent greater than the entire population of the six New England States. As those States in 1920 has 7,400,909 people, this means a five-year gain for the United States of more than 10,000,000. An increase of 2,000,000 people per annum, with a consumption around 900 lb. of in-

gots per person, represents in itself some 800,000 tons of steel each year for which there was no demand the previous year. So long as the per capita use of steel continues to expand, demand must increase still more rapidly than population.

Coal and Coke in 1926

PRELIMINARY figures have been issued representing production of coal and coke in 1926. It is noted that in coal the year came second best, having been exceeded by 1918. In coke the year was third best, having been exceeded by 1918 and 1923, but the differences were quite small. As 1923 was an exceptional pig iron year, making up for exhaustion of stocks of pig iron and scrap in 1922, the coal strike year, the fact that coke production ran high relative to coal production is not important.

Approximate production in 1926 was:

	Net Tons		Net Tons
Bituminous coal.	578,290,000	By-product coke.	44,500,000
Anthracite	85,000,000	Beehive coke....	11,500,000
Total coal	663,290,000	Total coke....	56,000,000

One does not see that there has been much progress made in the economic use of bituminous coal by putting it through retorts and thus saving the gas while making a solid fuel, coke, which is better for various heating purposes than is raw coal. In 1900 only 5 per cent of the coke made was by-product, while in 1926 the proportion was almost 80 per cent. Increases in production, 1900 to 1926, were: Bituminous coal, 172 per cent; beehive and by-product coke, 173 per cent; pig iron, 185 per cent.

One definite thing was accomplished by blast furnaces. While the increase in pig iron production was greater than the increase in coke production, that was not at the expense of coke used for other purposes, so much less coke being used per ton of pig iron that more coke was left for other purposes. There are no data for 1900 whereby a precise comparison could be made, but the fact is beyond doubt.

The two economies developed from 1900 to 1926 were the supplanting, very largely, of beehive coking by by-product coking, and the decrease in the amount of coke needed to produce a ton of pig iron. Much more economy is dictated. Much coal should be coked for other purposes. As it is, nearly all our coke is used for the smelting of iron ore and some other ores of relatively very minor tonnage, and for melting pig iron and some non-ferrous metals.

For 1925 precise figures are available, showing that coke yield of coal was 69.9 per cent in by-product coking and 65.2 per cent in beehive coking. Applying the same percentages to 1926 coke production it appears that about 81,300,000 tons of coal were coked last year, or 14.1 per cent of the total bituminous coal production. That is a small proportion, particularly so when the great bulk of the coking was forced by the fact that the smelting and melting processes demanded nearly all the coke produced.

The decadence in the relative proportion of anthracite produced is a strong influence toward the production of coke for domestic use. Production of anthracite is substantially stationary at

about 90,000,000 tons a year except when prevented by strikes. Such a tonnage was reached in 1911 and has since been exceeded rarely, while on account of the 1925-6 strike one year's production was very scant and the other year's production slightly off. Yet for 1923 it was estimated that 44 per cent of the total domestic coal consumption was anthracite.

European Export Steel Prices

IF the aim of the organizers of the European steel cartel was to establish higher selling prices both for domestic and foreign shipment, it has apparently failed in this purpose. For a time last year, about October, prices did rise several dollars a ton; in fact, they rose to a point where they were no longer attractive to some American buyers. But since the first of the year the trend has been slightly downward, so that now merchant steel bars are offered at \$3.35 a ton below the quotations that were available from the same producers in October. Except for the bulge of prices in the fall, which was the result largely of demand growing out of the crippling of British production by the coal strike, the decline in Continental European steel prices has been steady since the formation of the cartel.

At the beginning of the year the cartel announced a reduction of 1,500,000 tons in the amount apportioned for the first quarter, and it was thought that this reduction in output might have a stimulating effect on European markets. Such has not proved true, and it is logical to assume that there will be a further reduction for second quarter unless the next few weeks bring sufficient business to make this unnecessary. French, Belgian and Luxemburg mills are all in need of tonnage.

Our European advices indicate that the mills there will soon be competing more sharply for export business. In recent months, while the higher prices abroad were ruling, the American steel trade has not been so much disturbed by spectacularly low import prices as during the earlier months of last year. December brought to this country 20 per cent less finished steel than did December, 1925, but the month was one of the low points of the past year in imports. World-wide buying, which is calculated to relieve European pressure on our coast lines, is yet slow in materializing, but it remains a large factor of possible relief. Meanwhile aggressive penetration of foreign steel and iron into the American market may hasten the achieving of another method of relief, that which calls for active participation of American producers, with proper governmental knowledge or supervision, in a general international understanding.

THOUGH there was a notably large production of ferromanganese in the United States last year, that of spiegeleisen was small. Blast furnace returns to THE IRON AGE show that 74,096 gross tons of spiegeleisen was made in 1926. The smallest post-war output was 56,400 tons in 1921 and the largest 129,600 tons in 1923. The decline reflects the contraction in Bessemer steel, which has been quite marked in the last two years. In 1925 and

1926 the Bessemer ingot production was only 14.8 per cent of the total against 15.6 per cent in 1924 and 18.8 per cent in 1923. Also the greater use of manganese-bearing pig irons in iron foundry and open-hearth steel practice is tending to lessen the need for so much manganese in the form of spiegeleisen or ferromanganese.

Manufactured Exports Gain

MUCH concern has been expressed at the dwindling excess of American exports over American imports. In the calendar year 1924 this excess was \$904 millions. In 1925 it dropped more than one-third, to \$593 millions. In 1926 it dropped again, more than two-thirds, to \$181 millions, or almost precisely one-fifth the margin of two years before.

Analysis of the relation of exports to imports in various forms of products, however, tells quite a different story. The excess of manufactured goods in 1924 was \$839 millions. In 1925 this excess increased to \$1,048 millions. Further expansion in 1926 gave \$1,080 millions. Here we have a condition in which, in 1924, the excess of manufactures made up nearly the entire export excess of all products. In 1925, however, the excess of manufactures was practically double the total excess, indicating an import excess of \$255 millions in goods under other classifications. In 1926 the manufactured excess is practically six times the total excess, and shows that about \$900 millions of other goods were imported in excess of the exports.

These, and other deductions which could be made from the figures covering partly manufactured goods, go to show that American manufactures are fully holding their own in the world markets, and that such inroads as are being made in the way of huge imports into the United States are mainly along non-manufactured lines, principally foods and raw materials.

Failures in Service

METAL which fails in service has a disconcerting way of puzzling the engineer. For one thing, the appearance of the break may not resemble anything which he remembers having seen in a testing laboratory. Instead of having a nice velvety fracture, it looks as coarse as loaf sugar. Instead of drawing down like proper metal, it broke with no apparent signs of ductility. (The odd part of it, too, is that test specimens cut from the piece will behave like perfectly proper metal!)

In the second place, the metal often breaks in service for no apparent reason. Sometimes it cracks when under no load of any sort. Other times, it gives way after successfully enduring far more severe stresses. Again it seems to act like an old draft horse, which just gets tired and quits after several years' faithful service.

It should not be inferred from the above that steam boilers, for example, are splitting open with great frequency. The very rarity of these peculiar breaks makes it doubly difficult to find the real reason. For instance, one condenser tube will crack, and 100 others right alongside remain perfect. One broken rail, out of 100,000, will be found by the track walkers.

The reliability of good metal, like that of a good friend, should not be questioned too lightly. In either case, a failure to act in the expected way should be examined with much care, to make sure that there is not in fact a sufficient reason, hidden from anything but careful search.

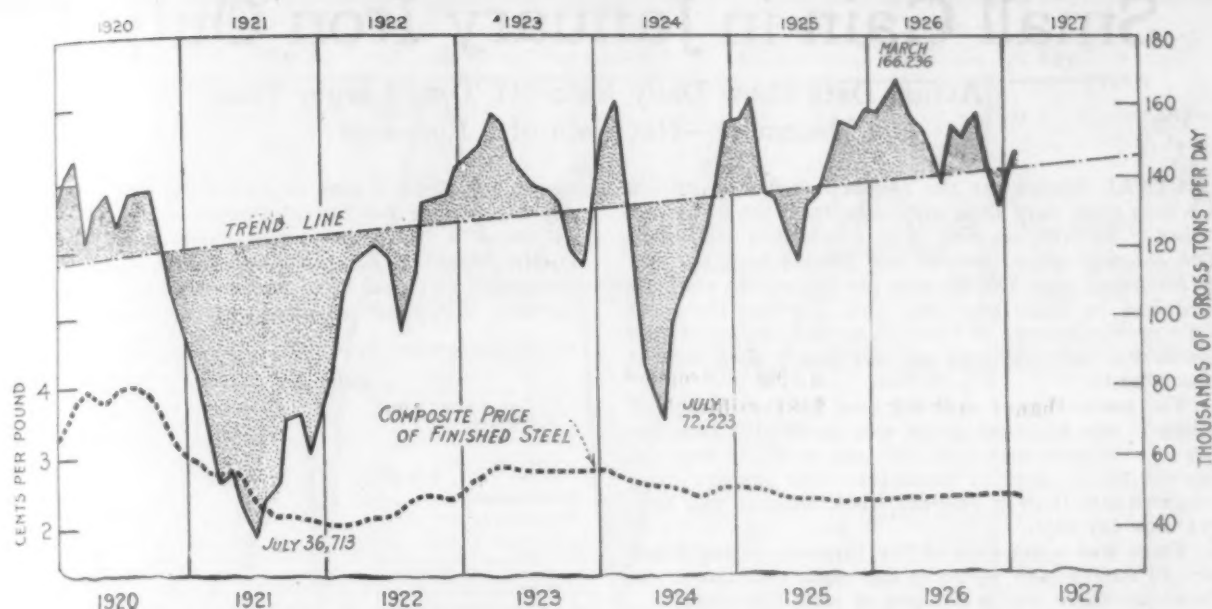
It is true that an enormous amount of study has been given to these obscure failures. There are so many explanations put forward, that it seems each incident may be a law to itself. But obviously the metal would not break unless it was bearing an overpowering load, or its normal resisting power seriously weakened. To avert failures, designers must be studious to avoid constructions which build up heavy localized stresses, far greater than the expected average in any given section. Manufacturers must realize that the best of metal can be ruined by abuse in fabrication, and the completed structure contain internal stresses of great severity resulting from improper cold work or heat treatment. Finally, users should know that much depends upon the care given the metal while in service; heavy overloads, incomplete lubrication, corrosive liquids or gases should be avoided at all costs.

When the mass of literature on this subject is stripped of its "intercrystalline and intracrystalline fractures," its "corrosion of the amorphous phase" and such other verbiage useful to the specialist, it boils down to just this: that oft repeated or long continued load will seek out points of weakness and failure will sometimes result. Sometimes the loads are self-imposed; they were placed within the metal itself by the manufacturing processes. Sometimes the points of weakness exist as defects in the metal; sometimes as deficiencies in the design or finish; sometimes they are induced by surface corrosion.

But practically all of these strange failures which are impossible to predict, which are almost impossible to duplicate in laboratory testing, and which have been sufficiently studied, seem to have resulted from a progressive failure starting from some minor defect and caused by overpowering stress at that point.

Don't blame the metal too quickly. The chances are that it would have fulfilled all expectations if it had been given a fair chance.

EIGHTY per cent of all the steel rolled last year was the product of 12 companies. Five made over two-thirds and eight accounted for over three-fourths. It took 25 companies to cover 90 per cent of the total and 39 to cover less than 94 per cent. Statistics received in considerable detail from 39 companies were analyzed in our annual number of Jan. 6. The wide variety in size of steel companies is well understood, but the figures here given afford the quantitative slant and for a year of high output and broad demand. Diversity in products is, of course, greatest in the case of sheets. Even 17 companies did not supply more than 70 per cent of all the sheets. Of the largest tonnage commodity, steel bars, 14 companies accounted for 80 per cent. In shapes, on the other hand, 80 per cent was made by three companies and, in pipe, 81 per cent by five companies.



Production of Steel Ingots in January Increased and Advanced Above the Line Representing the Trend of Consumption

January Ingot Output Up Sharply

Daily Rate 13,214 Tons or 9.6 Per Cent Larger Than in December—Smaller Than in January Last Year

STEEL ingot production in January increased sharply. At 3,806,888 gross tons or 146,419 tons per day the increase over December was 12,881 tons per day or 9.6 per cent, according to data compiled by the American Iron and Steel Institute. The January production was larger also than November. In January, a year ago, the daily rate was 159,633 tons or 13,214 tons per day larger than for January, this year.

The statistics show that the January production of the companies which made 94.50 per cent of the country's total in 1925 was 3,597,509 tons. Assuming that the 5.50 per cent not reporting produced at the same rate, a total January output is indicated of 3,806,888 tons from which a daily rate of 146,419 tons was calculated, allowing for 26 working days. According to the estimates of the institute, January operations were 81.54 per cent of "theoretical" capacity, compared with 74.37 per cent in December, 79.73 per cent in November and 87.66 per cent in October. The average operating rate for 1926 was 84.40 per cent and in 1925 it was 79.05 per cent.

The table gives the reported production by months

of the different kinds of steel, together with the estimated daily rate for all companies.

Bethlehem Again Offers Preferred Stock to Employees on Deferred Payment Plan

Employees of the Bethlehem Steel Corporation are again offered preferred stock of the company on the deferred payment plan, the price per share this year being \$107. One share may be purchased for each \$400 of employee's earnings, and payment may be made at a minimum rate of \$4 per month, the amount to be deducted monthly from the employee's pay. Interest is charged at the rate of 5 per cent on the unpaid monthly balances of the purchase price of the stock, but the purchaser is credited with dividend payments on the stock. Dividends to the amount of \$1,089,043 have been paid to employees under previous offerings of the stock. The plan also provides for a special benefit payment applicable each year for a period of five years for those who hold the stock and remain employees of the corporation. Benefit payments amounting to \$283,847 have been made to employees on stock purchased under previous offerings.

Production of Steel Ingots

Months	(Gross Tons)			Calculated Monthly Production All Companies	Approximate Daily Production All Companies
	Reported by companies Which Made 94.50 Per Cent of the Steel Ingot Production in 1925				
	Open-Hearth	Bessemer	All Other		
1927					
Jan.	3,041,233	545,690	10,566	3,806,888	146,419
1926					
Jan.	3,326,846	581,683	13,664	4,150,469	159,633
Feb.	3,023,829	556,031	12,818	3,801,776	158,407
March	3,590,791	635,680	15,031	4,488,362	166,236
April	3,282,435	601,037	13,652	4,123,941	158,613
May	3,201,230	516,676	10,437	3,945,336	151,744
June	3,036,162	498,764	9,441	3,750,653	144,256
July	2,911,375	526,500	12,372	3,651,055	140,425
Aug.	3,145,055	627,273	12,003	4,004,583	154,022
Sept.	3,089,240	612,588	12,660	3,930,675	151,180
Oct.	3,224,584	630,526	12,348	4,092,548	157,406
Nov.	2,915,558	592,239	9,605	3,722,119	143,158
Dec.	2,778,949	493,172	8,919	3,472,000	133,538
Total	37,526,054	6,872,169	142,950	47,133,517	181,555

Miners Not Willing to Accept Wage Reduction

Bituminous coal miners of Illinois, Indiana, Ohio and western Pennsylvania are not willing to negotiate a new wage scale on the basis of a reduction in present wages, according to recommendations of the wage scale committee's report, which was sanctioned by the national convention of the United Mine Workers of America on the closing day of its meeting at Indianapolis last week. The Jacksonville agreement, now in effect, stipulates a daily wage rate of \$7.50 for union miners, and a new wage contract will be submitted to the miners for ratification before the expiration of the old agreement on March 31. Officers of the miners' union and operators in the States mentioned above will meet in joint conference at Miami, Fla., on Feb. 14 to discuss a new agreement.

Small Gain in January Iron Output

Actual Data Show Daily Rate 411 Tons Larger Than December—Net Gain of 5 Furnaces

ACTUAL figures for the January production of pig iron show very little difference from the estimates, collected by wire on Feb. 1 and published last week. The January actual output was 100,123 tons per day as compared with 100,000 tons per day as the estimate published in THE IRON AGE Feb. 3. The December daily production was 99,712 tons so that the output last month was only 411 tons per day larger than that of December.

The production of coke pig iron for the 31 days of January was 3,103,820 gross tons or 100,123 tons per day as compared with 3,091,060 tons or 99,712 tons per day for the 31 days in December. The January daily rate was less than in January, 1926, when it was 106,974 tons per day.

There was a net gain of five furnaces during January, 13 having been blown in and eight shut down. In December there was a net loss of nine furnaces.

Capacity Active on Feb. 1

On Feb. 1 there were 208 furnaces active as compared with 203 on Jan. 1. The estimated daily capacity of the 208 furnaces blowing on the first day of this

month was 100,635 tons as contrasted with 98,360 tons per day for the 203 furnaces active on Jan. 1. Of the 13 furnaces blown in during January, five belonged to the Steel Corporation, four to independent steel companies and four were merchant stacks. The eight furnaces blown out or banked are credited as follows:

Coke Furnaces in Blast					
Furnaces	Total	Feb. 1		Jan. 1	
		In	Capacity	In	Capacity
New York:	Stacks	Blast	per Day	Blast	per Day
Buffalo	21	11	5,000	12	5,220
Other N. Y. and Mass.	6	5	1,720	5	1,685
New Jersey	3	0	....	0	....
Pennsylvania:					
Lehigh Valley	11	6	2,475	7	2,935
Spiegeleisen	2	2	240	2	230
Schuylkill Valley	12	6	2,530	6	2,425
Susquehanna Valley	4	3	1,245	3	1,265
Ferromanganese	1	1	75	1	75
Lebanon Valley	1	1	220	1	225
Ferromanganese	2	1	70	0	....
Pittsburgh District	52	35	20,740	34	19,665
Ferro. and Spiegel	4	3	440	3	450
Shenango Valley	13	7	3,545	7	3,370
Western Pennsylvania	18	5	2,825	5	2,570
Ferromanganese	2	2	315	2	380
Maryland	5	6	2,480	5	2,125
Ferromanganese	1	0	....	0	....
Wheeling District	13	9	4,400	9	4,600
Ohio:					
Mahoning Valley	26	16	9,100	16	9,000
Central and Northern	23	17	9,765	17	9,970
Southern	13	5	1,540	5	1,385
Illinois and Indiana	44	29	17,450	29	17,500
Mich., Wis. and Minn.	12	7	3,055	7	3,065
Colo., Mo. and Utah	7	4	1,845	4	1,820
The South:					
Virginia	16	1	235	1	240
Ferromanganese	1	1	85	1	85
Kentucky	5	1	305	1	375
Alabama	34	22	8,660	19	7,490
Ferromanganese	1	1	70	0	....
Tennessee	12	1	205	1	210
Total	365	208	100,635	203	98,360

Daily Rate of Pig Iron Production by Months—Gross Tons			
	Steel Works	Merchant*	Total
January, 1926	83,867	23,107	106,974
February	81,148	23,260	104,408
March	85,841	25,191	111,032
April	89,236	25,768	115,004
May	86,682	25,622	112,304
June	82,186	25,658	107,844
July	79,392	24,586	103,978
August	78,216	25,025	103,241
September	81,224	23,319	104,543
October	83,188	24,365	107,553
November	82,820	25,070	107,890
December	74,909	24,803	99,712
January, 1927	75,609	24,514	100,123

*Includes pig iron made for the market by steel companies.

Pig Iron Production by Districts, Gross Tons				
	Jan. (31 days)	Dec. (31 days)	Nov. (30 days)	Oct. (31 days)
New York and Mass.	212,856	210,243	218,657	224,631
Lehigh Valley	89,381	88,182	97,722	89,804
Schuylkill Valley	79,010	65,283	64,716	69,221
Lower Susq. and Lebanon Valleys.	48,313	48,537	47,413	36,639
Pittsburgh district	654,225	645,592	632,246	728,650
Shenango Valley	105,748	96,732	93,466	109,450
Western Penna.	97,818	105,996	118,005	134,104
Maryland, Virginia and Kentucky	89,990	88,488	87,659	90,117
Wheeling district	130,872	128,077	111,166	109,241
Mahoning Valley	287,686	281,275	316,586	342,437
Central and North- ern Ohio	302,339	321,684	347,547	345,124
Southern Ohio	47,160	42,892	50,757	43,843
Illinois and Indiana	553,013	557,064	568,312	602,672
Mich., Minn., Mo. Wis., Colo. and Utah	152,266	151,468	150,981	152,615
Alabama	246,536	252,932	274,604	249,584
Tennessee	6,607	6,615	6,870	6,000
Total	3,103,820	3,091,060	3,236,707	3,334,132

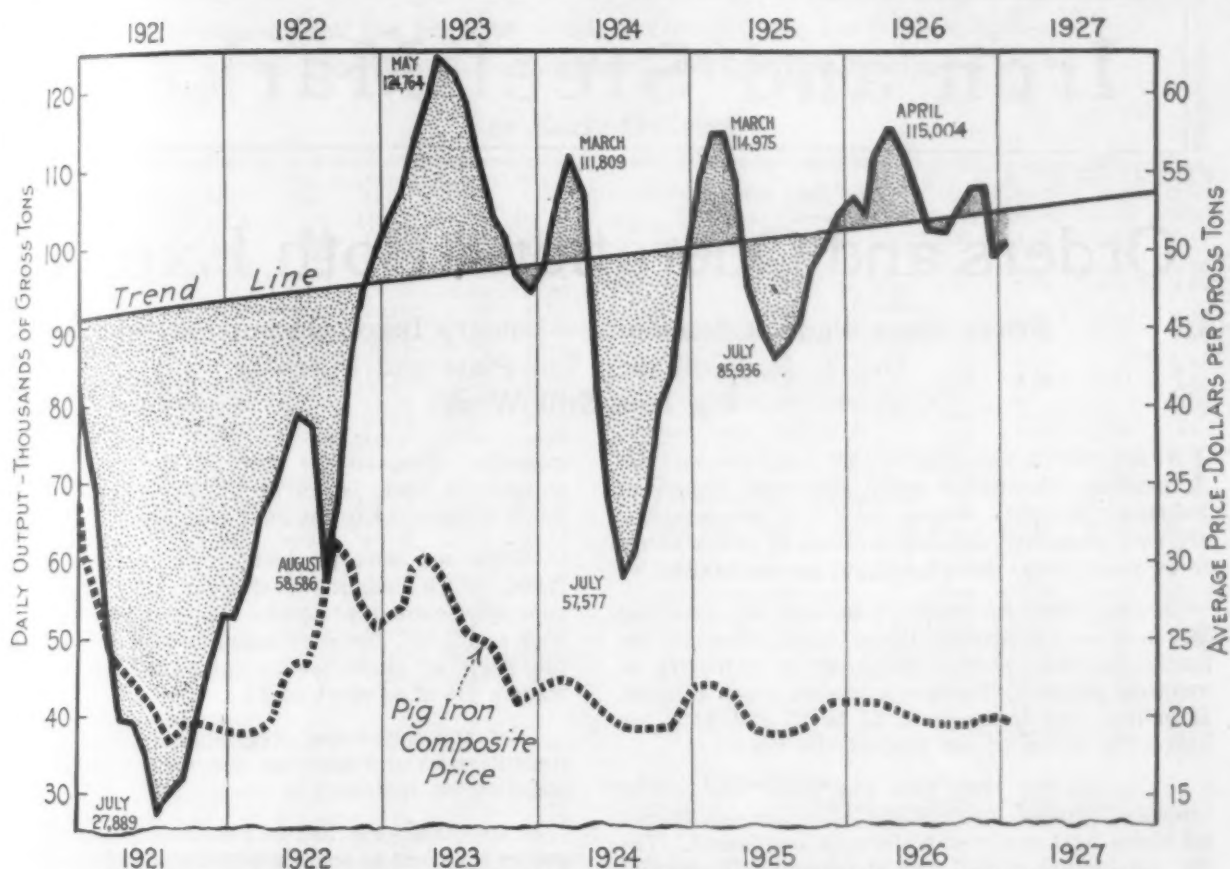
Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1922—Gross Tons				
	1923	1924	1925	1926
Jan.	104,181	97,384	108,720	106,974
Feb.	106,935	106,026	114,791	104,408
Mar.	113,673	111,809	114,975	111,032
Apr.	118,324	107,781	108,632	115,004
May	124,764	84,358	94,542	112,304
June	122,548	67,541	89,115	107,844
½ year	115,147	95,794	105,039	109,660
July	118,656	57,577	85,936	103,978
Aug.	111,274	60,875	87,241	103,241
Sept.	104,184	68,442	90,873	104,543
Oct.	101,586	79,907	97,528	107,553
Nov.	96,476	83,656	100,767	107,890
Dec.	94,225	95,539	104,853	99,712
Year	109,713	85,075	99,735	107,043

Production of Steel Companies for Own Use—Gross Tons				
	Total Iron, Spiegel and Ferro		Spiegeleisen and Ferromanganese*	
	1926	1927	1926	1927
Jan.	2,599,876	2,343,881	29,129	7,746
Feb.	2,272,150	....	22,309	7,084
Mar.	2,661,092	....	24,064	7,339
Apr.	2,677,094	....	24,134	7,051
May	2,687,138	....	23,159	6,999
June	2,465,583	....	25,378	5,864
½ year	15,362,933	....	148,173	42,083
July	2,461,161	....	26,877	3,699
Aug.	2,424,687	....	23,557	4,372
Sept.	2,436,733	....	25,218	2,925
Oct.	2,578,830	....	28,473	6,295
Nov.	2,484,620	....	31,903	7,565
Dec.	2,322,180	....	31,627	7,157
Year	30,071,144	....	315,828	74,096

*Includes output of merchant furnaces.

Production of Coke and Anthracite Pig Iron in United States By Months, Beginning Jan. 1, 1924—Gross Tons			
	1925	1926	1927
Jan.	3,370,336	3,316,201	3,103,820
Feb.	3,214,143	2,923,415	....
Mar.	3,564,247	3,441,986	....
Apr.	3,258,958	3,450,122	....
May	2,930,807	3,481,428	....
June	2,673,457	3,235,309	....
½ year	19,011,948	19,848,461	....
July	2,664,024	3,223,338	....
Aug.	2,704,476	3,200,479	....
Sept.	2,726,198	3,136,293	....
Oct.	3,023,370	3,334,132	....
Nov.	3,023,006	3,236,707	....
Dec.	3,250,448	3,091,060	....
Year*	36,403,470	39,070,470	....

*These totals do not include charcoal pig iron. The 1925 production of this iron was 196,164 tons.



Daily Pig Iron Output in January Slightly Larger Than in December; Composite Price Unchanged

Inclined line represents the gradually increasing theoretical needs of the country, and shows that production is slightly below the so-called normal. Dotted line represents THE IRON AGE composite price

four to independent steel companies, three to merchant producers and one to the Steel Corporation.

Manganese Alloys Produced

There were 31,844 tons of ferromanganese produced in January which compares with 31,627 tons in December and 31,903 tons in November. The spiegel-eisen output last month was 7486 tons as compared with 7157 tons in December.

Total Number of Furnaces Reduced

The possibly active list of furnaces has been reduced from 371 to 365. The Bethlehem Steel Corporation no longer carries on its active list the following furnaces: two at its Steelton plant, one at its Bethlehem plant and the three furnaces in the Lebanon Valley.

Furnaces Blown In and Out

Among the furnaces blown in during January were the Sheridan furnace in the Lebanon Valley; one Carrie furnace and the Edgar Thomson furnace of the Carnegie Steel Co. in the Pittsburgh district; the Stewart furnace in the Shenango Valley; E furnace of the Bethlehem Steel Corporation in Maryland; No. 2 Mingo furnace of the Carnegie Steel Co. in the Wheeling district; one Haselton furnace of the Republic Iron & Steel Co. and the Cherry Valley furnace in the Mahoning Valley; one furnace of the Inland Steel Co. in the Chicago district; No. 3 furnace of the Sloss-Sheffield Steel & Iron Co.; No. 6 Ensley furnace of the Tennessee Coal, Iron & Railroad Co., one Woodward furnace of the Woodward Iron Co. and one Pioneer furnace in Alabama.

Among the furnaces blown out or banked during January was one furnace of the Wickwire Spencer Steel Corporation in the Buffalo district; B furnace of the Bethlehem Steel Corporation in the Lehigh Valley; one Edgar Thomson furnace of the Carnegie Steel Co. in the Pittsburgh district; the Sharpsville furnace in

the Shenango Valley; No. 1 furnace of the Weirton Steel Co. in the Wheeling district; No. 2 Hubbard furnace of the Youngstown Sheet & Tube Co. and the Mattie furnace in the Mahoning Valley, and No. 5 Iroquois furnace in the Chicago district.

Republic's Earnings Show Sharp Increase in 1926

Republic Iron & Steel Co. reports net profits for the year ended Dec. 31, 1926, of \$5,065,022, equivalent after Federal taxes, interest, depreciation and preferred dividends to \$11.05 on the common stock. This compares with \$3,813,484 or \$6.87 per share of common stock in 1925. During the year the company spent \$2,060,366 for new construction. Net surplus carried to balance sheet as of Dec. 31, 1926, was \$34,836,163, comparing with \$33,562,389 on the same date in 1925.

Gross volume of business during the year amounted to \$53,890,445, as compared with \$53,907,959 for the preceding year. Total annual shipments of finished, semi-finished products and pig iron amounted to 1,015,926 tons in 1926 and 1,107,039 tons in 1925. Unfilled orders of finished and semi-finished material at the end of the year totaled 157,250 tons, compared with 223,973 tons one year ago. Pig iron on order on Dec. 31, 1926, amounted to 44,010 tons, compared with 64,463 tons at the end of 1925.

"Compressive Strength of Column Web Plates and Wide Web Columns" is the title of technologic paper, No. 327, of the United States Bureau of Standards. The author is Robert S. Johnston. The investigation discussed by the paper had as its major problem the verification of the design rule that wide web plates in compression should not exceed in width 30 times the thickness of the plate.

Iron and Steel Markets

Orders and Operations Both Expand

Prices Show Signs of Stabilizing—January Ingot Output Partly
Due to Rails, Shapes, Tin Plate and Pipe—
Pig Iron Still Weak

INCREASING specifications on contracts and expanding operations mark the first fourth of February in steel. Fewer deep cuts in quotations are now uncovered and stabilization of prices seems to be under way, though not yet accomplished.

Rather than rebounding, as was the case last March when a temporary unsettlement occurred, the market on bars, shapes, plates, sheets and wire, to mention principal forms of finished steel affected, is finding new levels from \$1 to \$3 and \$4 a ton below the prices of the first of the year.

It is not yet clear that any great releases of tonnage followed the yielding of prices, as rolling schedules have not been materially lengthened. The full production of rail and structural mills and of pipe for oil country needs and of tin plate throughout last month is an explanation of the stepping up in steel making in the face of the parallel recessions. Also there has been some stocking of ingots.

The January ingot output, 3,807,000 tons, was nearly 10 per cent more than that of December, and while it is by a like percentage under the production of January, 1926, February a year ago fell off from January, while signs now are for broadening activity. Another Gary blast furnace has been blown in, the second in two weeks, and one of the Ohio works stacks of the Carnegie Steel Co. has gone in.

Chicago mills are operating at close to 85 per cent, or higher than mills farther east. Bar mills there are on a 90 per cent basis. Some further price recessions in that district are a response to activity in territory competitive with the East.

Structural steel inquiries are numerous and total about 43,000 tons, including 15,000 tons for a Newark, N. J., department store, 10,000 tons for a bridge over the Columbia River in Washington, 5000 tons for a newspaper building in Chicago and a like tonnage for a New York school building. Bookings covered 25,000 tons, of which 11,000 tons was in New York and 4000 tons will go into a railroad bridge over the Hackensack River, New Jersey.

The American Shipbuilding Co. will build two oil tankers for which Pittsburgh will supply the 1200 tons of plates required.

The Burlington and Canadian National railroads have ordered 1000 cars each, out of a week's total of 2250. Additional inquiries are for 625 cars and there is also good inquiry for steel underframes and superstructures. Fully 100,000 tons of track accessories, it is estimated, are yet to be bought under the season's needs.

Alloy steel bar output is close to full mill

capacity. Demand for steel in general from the automobile trade is not up to expectations, though much is expected in the next two months.

Wire and wire products, save for woven wire fence, which remains unchanged, are now rather generally quoted at 2.40c., Pittsburgh, for plain wire and 2.55c. for wire nails, or \$2 a ton off from the basis of three weeks ago, after sales which made a dip of as much as \$3.

Hot and cold rolled strip steels still show wide irregularities and have not approached the state of stabilization indicated in sheets.

In tin plate, only one or two makers are without orders sufficient to sustain physically full operations over most of the first half of the year. Apprehension of a fuel shortage with the threatened coal strike is evidently leading container manufacturers to anticipate requirements.

Business in pipe is good for the season, with the greater activity in the lapwelded product. Demand is not taking the present production of 75 per cent operation, but price cuts reported on standard weight pipe lack proof.

The pig iron market apparently has not yet found bottom. In the Cleveland district and along Eastern seaboard fresh concessions in prices have driven in a fair volume of business. At Cleveland, where \$17.50, base furnace, has become an open price on outside shipments, bookings for the week totaled 40,000 tons. In New York, eastern Pennsylvania and New England combined sales totaled 35,000 tons, with prices subject to sharper concessions, especially on Buffalo iron, on which \$17.50, furnace, has been done. At Boston, January was the first month in two years to show no imports of pig iron. At Chicago a merchant furnace has been blown out.

Liberal stocking of coal, relieving concern over the possibility of a coal strike, has had its effect in bringing no important changes in coke or coal prices. All of the open-shop mines and coke plants except one have reduced wages of day labor to \$6, and some of the small operators have succeeded in holding their men on the November, 1917, scale, calling for \$5.

A common price card for bolts, nuts and rivets, with a common discount of 70 per cent, is expected to become effective about April 1.

Both of THE IRON AGE composite prices are lower, that for pig iron having dropped to \$19.18 from \$19.21 last week. It was \$21.79 one year ago. The finished steel composite is down to 2.374c. per lb., the lowest figure since 1922. It was 2.396c. last week and 2.439c. a month ago.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

For Early Delivery

Pig Iron, Per Gross Ton:	Feb. 8, 1927	Feb. 1, 1927	Jan. 11, 1927	Feb. 9, 1926
No. 2, fdy., Philadelphia...	\$21.76	\$21.76	\$22.26	\$23.76
No. 2, Valley furnace....	18.50	18.50	18.50	20.50
No. 2, Southern, Cin'ti...	21.69	21.69	21.69	25.69
No. 2, Birmingham.....	18.00	18.00	18.00	22.00
No. 2, foundry, Chicago*	20.50	20.50	21.00	23.00
Basic, del'd eastern Pa...	21.25	21.50	21.50	23.00
Basic, Valley furnace....	18.00	18.00	18.00	20.00
Valley Bessemer, del. P'gh	20.76	20.76	21.26	22.76
Malleable, Chicago*	20.50	20.50	21.00	23.00
Malleable, Valley.....	18.50	18.50	18.50	20.50
Gray forge, Pittsburgh..	19.76	19.76	19.76	21.76
L. S. charcoal, Chicago...	27.04	27.04	27.04	29.04
Ferromanganese, furnace	100.00	100.00	100.00	115.00

Rails, Billets, etc., Per Gross Ton:	Feb. 8, 1927	Feb. 1, 1927	Jan. 11, 1927	Feb. 9, 1926
O.-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$43.00
Light rails, at mill.....	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh..	33.00	33.00	35.00	35.00
O.-h. billets, Pittsburgh..	33.00	33.00	35.00	35.00
O.-h. sheet bars, P'gh....	34.00	34.00	36.00	36.00
Forging billets, P'gh....	40.00	40.00	40.00	40.00
O.-h. billets, Phila.....	38.30	40.30	40.30	41.30
Wire rods, Pittsburgh....	43.00	43.00	45.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.90	1.90	1.90	1.90

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.22	2.22	2.22	2.22
Iron bars, Chicago.....	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh...	1.90	1.90	2.00	2.00
Steel bars, Chicago.....	2.00	2.10	2.10	2.10
Steel bars, New York....	2.24	2.24	2.34	2.34
Tank plates, Pittsburgh..	1.85	1.90	1.90	1.80
Tank plates, Chicago....	2.00	2.10	2.10	2.10
Tank plates, New York...	2.19	2.24	2.24	3.09
Beams, Pittsburgh.....	1.90	1.90	2.00	1.90
Beams, Chicago.....	2.00	2.10	2.10	2.10
Beams, New York.....	2.24	2.24	2.34	2.24
Steel hoops, Pittsburg...	2.20	2.25	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Feb. 8, 1927	Feb. 1, 1927	Jan. 11, 1927	Feb. 9, 1926
Sheets, black, No. 24, P'gh	2.80	2.85	2.90	3.10
Sheets, black, No. 24, Chi-				
cago dist. mill.....	2.90	3.00	3.20	3.30
Sheets, galv., No. 24, P'gh	3.75	3.75	3.75	4.05
Sheets, galv., No. 24, Chi-				
cago dist. mill.....	3.85	3.85	3.95	4.25
Sheets, blue, 9 and 10, P'gh	2.20	2.20	2.25	2.50
Sheets, blue, 9 and 10,				
Chicago dist. mill.....	2.30	2.35	2.50	2.60
Wire nails, Pittsburgh...	2.55	2.60	2.65	2.65
Wire nails, Chicago. dist.				
mill.....	2.60	2.65	2.70	2.70
Plain wire, Pittsburgh...	2.40	2.45	2.50	2.50
Plain wire, Chicago. dist.				
mill.....	2.45	2.50	2.55	2.55
Barbed wire, galv., P'gh.	3.25	3.30	3.35	3.35
Barbed wire, galv., Chicago				
dist. mill.....	3.30	3.35	3.40	3.40
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	Feb. 8, 1927	Feb. 1, 1927	Jan. 11, 1927	Feb. 9, 1926
Carwheels, Chicago.....	\$15.00	\$15.50	\$15.25	\$17.00
Carwheels, Philadelphia..	16.00	16.00	16.50	17.50
Heavy melting steel, P'gh	16.00	16.50	17.00	17.50
Heavy melting steel, Phila.	14.50	15.00	15.50	16.00
Heavy melting steel, Ch'go	13.00	13.25	13.25	13.75
No. 1 cast, Pittsburgh...	15.75	15.75	16.00	17.00
No. 1 cast, Philadelphia..	17.00	17.00	17.00	18.00
No. 1 cast, Ch'go (net ton)	16.50	16.50	16.50	17.00
No. 1 RR. wrot. Phila....	17.00	17.00	17.00	18.00
No. 1 RR. wrot. Ch'go (net)	11.75	12.75	12.50	12.75

Coke, Connellsville, Per Net Ton at Oven:	Feb. 8, 1927	Feb. 1, 1927	Jan. 11, 1927	Feb. 9, 1926
Furnace coke, prompt....	\$3.25	\$3.25	\$3.50	\$10.50
Foundry coke, prompt....	4.25	4.25	4.50	11.50

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	12.75	12.25	12.25	14.50
Electrolytic copper, refinery	12.50	12.87 1/2	13.00	14.00
Zinc, St. Louis.....	6.55	6.57 1/2	6.85	8.07 1/2
Zinc, New York.....	6.90	6.92 1/2	7.20	8.42 1/2
Lead, St. Louis.....	7.22 1/2	7.20	7.47 1/2	9.12 1/2
Lead, New York.....	7.40	7.40	7.65	9.25
Tin (Strait), New York...	69.50	66.50	66.87 1/2	63.50
Antimony (Asiatic), N. Y.	15.25	14.50	14.00	21.50

Pittsburgh

Steel Buying Shows Further Gain—Large Pipe Project—Wire and Nails Reduced

PITTSBURGH, Feb. 8.—The first week of February has seen a continuance of the moderate upward tendency of last month in steel buying, and there is now the expectation that the month will score as much of a gain over January in sales, specifications and shipments as that month did over December. Expressed in the country's ingot production, last month was approximately 10 per cent better than the month before, although it failed to attain the mark of the same month last year by a like amount. March usually sees some expansion in consumption of steel, and there undoubtedly has been and will be preparation for such a development.

Railroad car buying has been heavier than it was to this date last year, the mills are well supplied with standard-section rails and with large-diameter pipe, and there is a prospect that it will not be easy to get prompt deliveries a little later on pipe, 10 in. and larger, as it is understood that reservations are being made for the gas line to run from Amarillo, Tex., to Denver, for which 325 miles of 20-in. pipe will be needed. The automotive industry is counted on to provide an increasing amount of tonnage in the next 60 days, when it is believed retail sales will be larger than they are now.

Steel business has not reached the volume nor are

manufacturers yet well enough supplied with orders to make a firmer price stand possible. It is said that a firmer attitude on prices, or at least insistence on the part of manufacturers that buyers take out the steel placed for delivery in this quarter by the end of the period, would make for a sounder situation. Prices in general still favor buyers. Plates, which long have held at 1.90c., base Pittsburgh, for either large or small lots, in the past week have developed a large-lot price as railroad car and structural work of size began to reach the mills.

Manufacturers of wire products generally have announced a new schedule \$2 per ton below the last formal one, applying to all products except woven wire fence. Sheets and strips are no stronger than they have been. Pipe stands out as the firmest product in the list, but reports of shading in butt-welded sizes persist.

Pig iron is inactive except for Bessemer grade, but prices cannot be marked down except upon the assumption that, if offered large tonnages, producers would make concessions. Scrap is sagging under its own weight, there being very little consumer interest.

There has been such liberal stocking of coal that the possibility that the union miners and operators may be unable to reach an agreement at Miami, Fla., at the conference starting next week is causing little concern, as supplies are sufficient to carry the industry for several months. But there is a fear that the non-union fields may be disturbed. The Carnegie Steel Co. has put on a blast furnace at its Ohio Works, Youngstown, making 33 furnaces active out of 51

owned by that company. Steel ingot production in this and nearby districts hovers around 75 per cent of capacity.

Pig Iron.—Sales of Bessemer iron amounting to 3600 tons have been made in this market in the past week, all carrying a price of \$19, Valley furnace. This constitutes the principal business of the week. The American Steel Foundries are seeking 2500 tons of basic iron for their Alliance, Ohio, works, but interest in that grade generally is low, because almost all other users either are well covered against their immediate requirements or have standing orders with regular sources of supply. The open market in this grade has become very limited. The quotation of merchant producers is still \$18, Valley furnace, but it is nominal and untested. Only carload lots of foundry iron are being sold, and these are going at \$18.50. There is a belief that less would be acceptable on really sizable tonnages. There seems to be a shortage of low phosphorus iron, and the market is firm at \$29.66 to \$29.76, delivered Pittsburgh district.

We quote f.o.b. Valley furnace, the freight for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$18.00
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	18.50
Low phosphorus copper free....	28.00

Steel and Iron Bars.—The ruling price on ordinary tonnages is 1.90c., base, Pittsburgh, and the few sales that are being made at 2c. are usually of carload lots in which the buyers have put 10 or more sizes. Mills serving the cold-finished steel bar makers, the railroad car builders and steel fabricators have fair-sized backlogs, and on merchant bars are not promising delivery quicker than two or three weeks on some sizes. As a rule, however, deliveries of merchant bars are being made promptly. Iron bars are only moderately active.

Structural Steel.—Large structural shapes are still commonly quoted at 1.90c., base, Pittsburgh, but, as usual, large projects command special consideration. Local fabricating shops are not as busy as those in other parts of the country, notably in the East. The Carnegie Steel Co. is offering its new Carnegie beam section.

Plates.—It is no longer possible to quote the market at a single price for large and small lots. A large-lot price of 1.80c., base, Pittsburgh, has appeared lately on large tonnages for railroad car building and structural steel work. On small lots, the market is still 1.90c.

Ferroalloys.—Steel companies are specifying against contracts for ferromanganese with somewhat more freedom than recently and the movement of 50 per cent ferrosilicon on contracts is well up to expected quotas, but in spiegeleisen specifications are light. The tonnage of the latter released by contract buyers, however, is finding a ready market, and prices are firm.

New business is light in all of these alloys. Prices are given on page 461.

Fluorspar.—Current demands for gravel spar are few and small. Most of the large users covered their winter requirements last fall, and there is rarely much of a movement in the winter months because consumers do not want material that has been subjected to the weather common to that season. Domestic spar is holding steadily at \$18 per net ton at mines, which means \$23.25 delivered at Pittsburgh or Buffalo for material with 85 per cent calcium fluoride and not over 5 per cent silica.

Semi-Finished Steel.—Business is not a great deal more active than it was before \$33, Pittsburgh or Youngstown, for large billets and slabs, and \$34 for sheet bars and small billets and slabs became open market quotations, probably because these prices represent little real concession to non-integrated manufacturers who have been depending on regular sources of supply. For instance, one strip manufacturer lately has been paying \$35, delivered, for slabs and billets, with no differential for size, which means an f.o.b. Pittsburgh price of \$33.75. In a general way, the recent f.o.b. Pittsburgh prices have actually been delivered prices at Pittsburgh district points. All makers of wire rods are now quoting \$43, base, Pittsburgh or Cleveland. Skelp is still nominally quoted at 1.90c., Pittsburgh, but plates are showing a weaker tendency, and usually skelp prices move along with those for plates.

Wire Products.—Effective Feb. 7, leading producers went formally to \$2.55, base, per keg, Pittsburgh, for bright nails and to \$2.40, base, per 100 lb. for bright hard wire. This represents a drop of \$1 a ton from the prices recently ruling and of \$2 per ton from the last formal price schedule and includes all products except woven wire fence, which remains at recent prices. Former differentials over Pittsburgh prices of \$1 per ton at Anderson, Ind., Chicago district mill and delivered Chicago, of \$2 a ton at Duluth, Minn., and of \$3 per ton at Birmingham and Worcester, Mass., are continued. The new schedule, it is believed, completely reflects the prices which competition had brought out. Business has suffered a good deal from the recent unsettlement.

Rails and Track Supplies.—The movement of standard-section rails on 1927 contracts is steady enough but reflects no urgency on the part of roads for large supplies in advance of the track-laying season. The accessories are still slow, and there is only a fair demand for light-section rails. Small spikes are subject to price shading, but prices of other items are where they were a week ago.

Tubular Goods.—Business is as good as it ever is at this time of the year, when building construction work is subnormal and oil and gas well drilling operations are hampered by weather or soil conditions. There is somewhat more activity in lapwelded than in butt-welded pipe, but combined business is still insuffi-

THE IRON AGE Composite Prices

Finished Steel

Feb. 8, 1927, 2.374c. Per Lb.

One week ago.....	2.396c.
One month ago.....	2.439c.
One year ago.....	2.424c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

High		Low		
1927	2.453c.	Jan. 4:	2.374c.	Feb. 8
1926	2.453c.	Jan. 5:	2.403c.	May 18
1925	2.560c.	Jan. 6:	2.396c.	Aug. 18
1924	2.789c.	Jan. 15:	2.460c.	Oct. 14
1923	2.824c.	April 24:	2.446c.	Jan. 2

Pig Iron

Feb. 8, 1927, \$19.13 Per Gross Ton

One week ago.....	\$19.21
One month ago.....	19.39
One year ago.....	21.79
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

High		Low		
1927	\$19.71	Jan. 4:	\$19.13	Feb. 8
1926	21.54	Jan. 5:	18.46	July 13
1925	22.50	Jan. 13:	18.96	July 7
1924	22.88	Feb. 26:	19.21	Nov. 3
1923	30.86	March 20:	20.77	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel	
	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.90c. to 2.00c.
F.o.b. Chicago.....	2.00c. to 2.10c.
Del'd Philadelphia.....	2.22c. to 2.32c.
Del'd New York.....	2.24c. to 2.34c.
Del'd Cleveland.....	2.09c. to 2.19c.
F.o.b. Cleveland, sizes up to 1-in. rounds,	1.90c. to 2.00c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
C.I.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	1.90c. to 2.00c.
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Rail Steel

F.o.b. mill.....	1.80c. to 1.90c.
F.o.b. Chicago.....	1.90c. to 2.00c.

Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	2.90c. to 3.00c.
Common iron, del'd Philadelphia.....	2.22c.
Common iron, del'd New York.....	2.24c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.80c. to 1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
Del'd Cleveland.....	2.09c.
Del'd Philadelphia.....	2.22c.
Del'd New York.....	2.19c. to 2.24c.
C.I.f. Pacific ports.....	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
Del'd Cleveland.....	2.09c. to 2.19c.
Del'd Philadelphia.....	2.12c. to 2.22c.
Del'd New York.....	2.14c. to 2.24c.
C.I.f. Pacific ports.....	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh,	2.10c. to 2.30c.
All gages, 6 in. and wider, P'gh.....	2.00c. to 2.10c.
All gages, narrower than 6 in., Chicago,	2.44c. to 2.50c.
All gages, 6 in. and wider, Chicago,	2.34c. to 2.40c.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.30c. to 2.40c.
Bars, f.o.b. Chicago.....	2.40c.
Bars, Cleveland.....	2.45c.
Shafting, ground, f.o.b. mill.....	2.55c. to 3.00c.
Strips, f.o.b. Pittsburgh mills.....	2.80c. to 3.05c.
Strips, f.o.b. Cleveland mills.....	2.85c. to 3.00c.
Strips, delivered Chicago.....	3.15c. to 3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.55
Galv'd nails, 1-in. and longer.....	4.55
Galv'd nails, shorter than 1-in.....	4.80
Galvanized staples.....	3.25
Polished staples.....	3.00
Cement coated nails.....	2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage.....	\$2.40
Annealed fence wire.....	2.55
Spring wire.....	3.40
Galv'd wire, No. 9.....	3.00
Barbed wire, galv'd.....	3.25
Barbed wire, painted.....	3.00

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh.....	2.10c. to 2.25c.
Nos. 9 and 10, f.o.b. Ohio mill.....	2.10c. to 2.30c.
Nos. 9 and 10, f.o.b. Chicago dist. mill.....	2.30c. to 2.40c.
Nos. 9 and 10, del'd Philadelphia.....	2.52c. to 2.62c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.50c. to 2.55c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.80c. to 2.90c.
No. 24, f.o.b. Ohio mill.....	2.80c. to 2.90c.
No. 24, f.o.b. Ch'go dist. mill.....	3.90c. to 3.00c.
No. 24, del'd Philadelphia.....	3.12c. to 3.22c.
No. 24, f.o.b. Birmingham.....	3.15c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	3.05c. to 4.05c.
No. 24, f.o.b. Pittsburgh, B grade.....	3.80c. to 3.90c.

Galvanized

No. 24, f.o.b. Pittsburgh.....	3.70c. to 3.80c.
No. 24, f.o.b. Ohio mill.....	3.75c.
No. 24, f.o.b. Chicago dist. mill.....	3.85c. to 3.95c.
No. 24, del'd Philadelphia.....	4.07c. to 4.17c.
No. 24, f.o.b. Birmingham.....	4.00c. to 4.05c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.00c. to 3.05c.
No. 28, f.o.b. Chicago dist. mill.....	3.10c. to 3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.15c.
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Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	4.30c.
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Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.....	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....	\$11.40
8-lb. coating I.C. 11.70	
15-lb. coating I.C. 14.85	
20-lb. coating I.C. \$16.20	
25-lb. coating I.C. 17.90	
30-lb. coating I.C. 19.45	
40-lb. coating I.C. 21.65	

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers	Base Per 100 Lb.
2100* (½% Nickel, 0.10% to 0.20% Carbon).....	\$3.00 to \$3.15
2300 (3¼% Nickel).....	4.30 to 4.40
2500 (5% Nickel).....	5.50 to 5.60
3100 (Nickel Chromium).....	3.80 to 3.90
3200 (Nickel Chromium).....	4.75 to 5.00
3300 (Nickel Chromium).....	7.00 to 7.25
3400 (Nickel Chromium).....	6.25 to 6.50
5100 (Chromium Steel).....	3.80 to 3.90
5200* (Chromium Steel).....	7.00 to 7.50
6100 (Chrom. Vanadium bars).....	4.20 to 4.80
6100 (Chrom. Vanad. spring steel).....	3.80
9250 (Silicon Manganese spring steel).....	3.20 to 3.25

Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.).....	4.10 to 4.20
Nickel Chrome Vanadium (0.50 Nickel, 0.50 Chrom., 0.15 Vanad.).....	4.20 to 4.30
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.).....	4.25 to 4.35
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.).....	3.40 to 3.50
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum).....	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$42.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	\$36.00 to \$38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ¾ in. and larger.....	\$2.80 to \$3.00
Spikes, ½ in. and smaller.....	2.90 to 3.25
Spikes, boat and barge.....	3.25
Track bolts, all sizes.....	3.90 to 4.50
Tie plates, steel.....	2.25
Angle bars.....	2.75

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
1½.....	45	19½	¾ to 1.....	22	+39
2.....	51	25½	1.....	22	2
2½.....	56	42½	1 to 1½.....	30	13
3.....	60	48½			
1 to 3.....	62	50½			

Lap Weld

2.....	55	43½	2.....	23	7
2½ to 6.....	59	47½	2½.....	26	11
7 and 8.....	56	48½	3 to 6.....	28	19
9 and 10.....	54	41½	7 to 12.....	26	11
11 and 12.....	53	40½			

Butt Weld, extra strong, plain ends

1½.....	41	24½	¾ to 1.....	+19	+54
2.....	47	30½	1.....	31	7
2½.....	53	42½	1 to 1½.....	38	13
3.....	58	47½			
1 to 1½.....	60	49½			
2 to 3.....	61	50½			

Lap Weld, extra strong, plain ends

2.....	53	42½	2.....	28	9
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 to 8.....	52	39½	7 to 8.....	31	7
9 and 10.....	45	32½	9 to 12.....	16	2
11 and 12.....	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel	Charcoal Iron
2 to 2½ in.....	27
2½ to 3 in.....	37
3 in.....	40
3½ to 4 in.....	42½
4 to 13 in.....	46
1½ in.....	1½ in.....
2 to 2½ in.....	2 to 2½ in.....
2½ to 3 in.....	2½ to 3 in.....
3 to 4 in.....	3 to 4 in.....

Beyond the above discounts, 5 to 7 five extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn	Hot Rolled
1 in.....	60
1½ to 1½ in.....	52
1½ in.....	36
2 to 2½ in.....	31
2½ to 2½ in.....	39
3 in.....	45
3½ to 3½ in.....	47
3½ in.....	50
4½, 5 and 6 in.....	45

Less carloads, 4 points less. Add \$5 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List

Carbon, 0.10% to 0.20%, base.....	55
Carbon, 0.20% to 0.40%, base.....	50
Plus differentials for lengths over 13 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.	

cient to take the production of a 75 per cent operation of the mills, which is the present average of mill engagement. Several mills have a fair backlog of line pipe, as delivery against some of the recent awards is not to be made until early spring, when road conditions will permit getting the pipe to location. Generally, pipe prices are holding well, but some cutting is reported on standard-weight pipe. The market in boiler tubes continues highly competitive. Discounts are given on page 459.

Sheets.—In view of mill operations of between 65 and 70 per cent of capacity, consumers apparently are not convinced that the decline in prices has run its course and consequently are not buying with confidence nor much ahead of their real requirements. Possibly the market would do better if producers took a firmer price stand, but with several still "hungry" for orders, it becomes necessary for others to meet the competition to preserve regular consuming connections. On black sheets 2.90c., base Pittsburgh, is all that is asked by any of the mills, while the ruling prices are 2.80c. to 2.85c. Galvanized sheets range generally from 3.70c. to 3.80c., with some sales reported down to 3.65c. and for small lots, as high as 3.85c. Blue annealed sheets take a range of from 2.10c. to 2.30c., but these prices are extremes, on large tonnages in the one case and for very small lots in the other. There seems to be no deviation from 4.15c., base, on automobile body sheets.

Tin Plate.—Only one or two makers lack orders sufficient to provide a physically full operation of productive capacity over much of the first half of the year. The possibility that an expected strike of union miners on April 1 will affect operation of the non-union mines and shorten coal supplies makes container manufacturers willing to anticipate their requirements. There is little doubt that the mills are running at a fuller rate than would be the case if there were not some uncertainty as to coal supplies when the demand for cans is at its highest and there is need of heavy supplies of plate. Fair export demand is reported.

Cold-Finished Steel Bars and Shafting.—Makers are not able to build up backlogs, as there has been some stepping up of production in keeping with larger specifications and shipments. The automotive industry is still feeling its way in the matter of larger production and is depending upon the mills to execute orders quickly. Buyers of very large tonnages are drawing against contracts carrying a price of 2.30c., base Pittsburgh, but on all other business 2.40c. is the quotation and there are no deviations from it.

Hot-Rolled Flats.—Prices are still unsettled but not quotably changed from those of the past two weeks. Round lots of strips, embracing both wide and narrow material, are selling on a common base, usually that for wide stock, but there has been no formal abandonment of the differential between wide and narrow strips. Makers of hoop steel or very narrow strips generally regard 2.20c., base, as minimum, and some will not go under 2.30c.

Cold-Rolled Strips.—The market appears a shade steadier, because of the fact that most makers have accumulated an order book on the recent break in

prices and can afford to be more independent. Small-lot business has been taken in the past week at 3.25c., base, which would work back on a schedule observed by some makers a short time ago to 2.85c. for lots of 50 tons or more. On really large lots 2.80c., base, has been and still can be done, and there are lower prices than 3.25c., base, on small lots.

Warehouse Business.—There has been no reflection in local warehouse prices of the recent declines in mill prices except in sheets.

Bolts, Nuts and Rivets.—Interest centers in a proposal to issue a common price card for bolts, nuts and rivets, with a common discount of 70 per cent. The matter has been under discussion for some time and is expected to be perfected and become effective around April 1. Current business in these lines is fairly active, with prices holding at recent levels.

Coke and Coal.—The past week has brought no important change in the market. Prices are just where they were a week ago on coke, and no material change is noted in coal prices. There is plenty of coal for all requirements, however, and prices favor buyers. If there is any concern over conditions after April 1, it is on the part of the coal producers rather than consumers, who are making preparations in such a way as not to disturb prices. All of the open-shop mines and coke plants, except those of the H. C. Frick Coke Co., are now paying the scale calling for \$6 per day to day labor, while some of the small operators have succeeded in holding their men on the November, 1917, scale, calling for \$5 for day labor.

Old Material.—Prices continue to recede, and on heavy melting steel not more than \$16 can be readily obtained, while dealers are bidding only \$15.50 for delivery at one point in the district where a recent sale of about 10,000 tons was made at \$16. There have been offerings of small lots of this grade at \$16 to consumers who have rather exacting requirements, but these were tonnages that had to be moved and it is probable that on an inquiry from melters 25c. and even 50c. a ton more would be asked. There are still some high-priced orders to be covered, but as buyers are not pressing for shipment, the sellers are not eagerly seeking supplies. Few of the other grades are commanding recent prices. The February scrap list of the Norfolk & Western Railway contains 5780 gross tons.

We quote for delivery to consumers' yards in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$16.00 to \$16.25
Scrap rails	15.50 to 16.00
No. 1 cast, cupola size.....	15.50 to 16.00
Compressed sheet steel.....	15.00
Bundled sheets, sides and ends...	14.00
Railroad knuckles and couplers...	18.00 to 18.50
Railroad coil and leaf springs...	18.00 to 18.50
Low phosphorus blooms and blilets ends	20.00 to 20.50
Low phosphorus mill plates.....	19.50 to 20.00
Low phosphorus, light grade.....	17.50 to 18.00
Low phosphorus punchings.....	18.00 to 18.50
Steel car axles.....	21.00 to 21.50
Cast iron wheels.....	16.00 to 16.50
Rolled steel wheels.....	18.00 to 18.50
Machine shop turnings.....	11.00 to 11.50
Short shoveling steel turnings...	12.00 to 12.50
Sheet bar crops	17.50 to 18.00
Heavy steel axles.....	14.50 to 15.00
Short mixed borings and turnings	12.00 to 12.50
Heavy breakable cast.....	14.50 to 15.00
Cast iron borings	12.00 to 12.50
No. 1 railroad wrought.....	12.50 to 13.00
No. 2 railroad wrought.....	16.00 to 16.25
Railroad or automobile malleable scrap	17.00 to 17.50

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Tank plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes.....	2.90c.
Reinforcing steel bars.....	2.90c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.60c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.30c.
Cold-finished shafting and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Spikes, large	3.30c.
Small	3.30c. to 5.25c.
Boat	3.80c.
Bolts, track	4.90c.
Wire, black soft annealed, base per 100 lb.	\$3.00
Wire, galvanized soft, base per 100 lb.	3.00
Common wire nails, per keg.....	3.00
Cement coated nails, per keg.....	3.05

Slight Gain in Employment in Metal-Working Shops

A slight gain in employment in December was reported by shops affiliated with the National Metal Trades Association, Chicago. In December the number employed totaled 585,494, as against 585,485 in November. The total was considerably below those for October and September, which were 610,425 and 634,780 respectively. The membership of the association includes plants in New England, New York, New Jersey, Pennsylvania, Maryland, Ohio, Indiana, Michigan, Wisconsin, Illinois, Iowa and Missouri.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms	
	Per Gross Ton
Rerolling, 4-in. and over.....	\$33.00
Rerolling, under 4-in. to and including 1½-in.	34.00
Forging, ordinary	40.00
Forging, guaranteed	45.00

Sheet Bars	
	Per Gross Ton
Open-hearth or Bessemer.....	\$36.00

Slabs	
	Per Gross Ton
8 in. x 2 in. and larger.....	\$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp	
	Per Lb.
Grooved	1.90c.
Sheared	1.90c.
Universal	1.90c.

Wire Rods	
	Per Gross Ton
*Common soft, base.....	\$43.00
Screw stock	\$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is \$44. Cleveland mill base, \$43.

Prices of Raw Materials

Ores	
Lake Superior Ores, Delivered Lower Lake Ports	
	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.49
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore	
	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria.....	9.50c. to 10c.
Iron ore, Swedish, average 66% iron.....	9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus.....	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$12.00 to \$13.50
Chrome ore, Indian basic, 48% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard.....	\$22.50
Molybdenum ore, 85% concentrates of MoS ₃ , delivered	50c. to 55c.

Coke	
	Per Net Ton
Furnace, f.o.b. Connellsville prompt	\$3.25
Foundry, f.o.b. Connellsville prompt	\$4.00 to 4.50
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	13.00
Foundry, by-product, Newark or Jersey City, delivered.....	9.50 to 10.77
Foundry, Birmingham	6.50 to 6.00
Foundry, by-product, St. Louis.....	10.50

Coal	
	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.75 to \$2.00
Mine run coking coal, f.o.b. W. Pa. mines	1.85 to 2.00
Mine run gas coal, f.o.b. Pa. mines	2.10 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.25 to 1.35
Gas slack, f.o.b. W. Pa. mines.....	1.40 to 1.50

Ferromanganese	
	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid	100.00

Spiegeleisen	
	Per Gross Ton Furnace
Domestic, 19 to 21%	\$37.00
Domestic, 16 to 19%	36.00

Electric Ferrosilicon	
	Per Gross Ton Delivered
50%	\$85.00
75%	145.00
Per Gross Ton Furnace	
10%	\$35.00
11%	37.00
Per Gross Ton	
12%	\$45 to 48.00

Bessemer Ferrosilicon	
F.o.b. Jackson County, Ohio, Furnace	
	Per Gross Ton
10%	\$34.00
11%	36.00

Silvery Iron	
F.o.b. Jackson County, Ohio, Furnace	
	Per Gross Ton
6%	\$28.50
7%	27.50
8%	28.50
9%	30.00
	Per Gross Ton
10%	\$32.00
11%	34.00
12%	36.00

Other Ferroalloys	
Ferrotungsten, per lb. contained metal, del'd	\$1.08 to \$1.10
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads.....	11.50c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace	\$3.25 to \$4.00
Ferrocobaltitium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18% Rockdale Tenn., base, per net ton.....	\$91.00
Ferrophosphorus, electric, 24%, f.o.b. An-niston, Ala., per net ton.....	\$122.50

Fluxes and Refractories

Fluorspar	
	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$18.00
No. 2 lump, Illinois and Kentucky mines.....	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,	\$17.00 to \$17.50

Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica f.o.b. Illinois and Kentucky mines.....	
	\$22.50

Fire Clay	
	Per 1000 f.o.b. Works
	High Duty Moderate Duty
Pennsylvania	\$40.00 to \$43.00 \$35.00 to \$40.00
Maryland	43.00 to 46.00 38.00 to 40.00
New Jersey.....	55.00 to 75.00
Ohio	40.00 to 43.00 35.00 to 40.00
Kentucky	40.00 to 43.00 35.00 to 40.00
Illinois	40.00 to 43.00 35.00 to 38.00
Missouri	40.00 to 43.00 35.00 to 38.00
Ground fire clay, per ton.....	6.50 to 7.50

Silica Brick	
	Per 1000 f.o.b. Works
Pennsylvania	\$40.00
Chicago	49.00
Birmingham	50.00
Silica clay, per ton.....	\$8.00 to 9.00

Magnesite Brick	
	Per Net Ton
Standard size, f.o.b. Baltimore and Chester, Pa.	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick	
	Per Net Ton
Standard size	\$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts	
(Less-than-Carload Lots)	
F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)	
	Per Cent Off List
Machine bolts, small, rolled threads.....	60 and 10
Machine bolts, all sizes, cut threads.....	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads	50, 10 and 10
Carriage bolts, cut threads, all sizes.....	50 and 10
Eye carriage bolts.....	65 and 10
Lag bolts	60, 10 and 10
Flow bolts, Nos. 3 and 7 heads.....	50 and 10
(Extra of 20% for other style heads)	
Machine bolts, c.p.c. and t. nuts, ½ x 4 in., larger and longer sizes.....	45, 10 and 5
Bolt ends with hot-pressed nuts.....	50, 10 and 10
Bolt ends with cold-pressed nuts.....	45, 10 and 5
Hot-pressed nuts, blank and tapped, square, 4.00c. per lb. off list	
Hot-pressed nuts, blank or tapped, hexagons, 4.40c. per lb. off list	
C.p.c. and t. square or hex. nuts, blank or tapped	4.10c. per lb. off list
Washers.....	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago and Pittsburgh.
The discount on machine, carriage and lag bolts is 5 per cent more than above for car lots. On hot-pressed and cold-pressed nuts the discount is 25c. more per 100 lb. than quoted above for car lots.

Bolts and Nuts	
(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)	
	Per Cent Off List
Semi-finished hexagon nuts:	
½ in. and smaller, U. S. S.	80, 10, 10 and 5
¾ in. and larger, U. S. S.	75, 10, 10 and 5
Small sizes, S. A. E.	80, 10, 10, 10 and 5
S. A. E., ½ in. and larger.....	75, 10, 10, 10 and 5
Stove bolts in packages.....	80, 10 and 5
Stove bolts in bulk.....	80, 10, 5 and 5
Tire bolts	60 and 5

Semi-Finished Castellated and Slotted Nuts	
(Actual freight allowed up to but not exceeding 50c. per 100 lb.)	
(To jobbers and consumers in large quantities)	
	Per 100 Net S.A.E. U.S.S.
¾-in.....	\$0.44 \$0.44
1-in.....	0.515 0.515
1½-in.....	0.62 0.66
2-in.....	0.79 0.90
2½-in.....	1.01 1.05
3-in.....	1.28 1.42
3½-in.....	1.70 1.73
4-in.....	2.10 2.10

Larger sizes.—Prices on application.

Large Rivets	
	Base per 100 Lb.
F.o.b. Pittsburgh	\$2.30 to \$2.40
F.o.b. Chicago	2.60

Small Rivets	
	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5 to 70 and 10
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10 and 5 to 70 and 10

Cap and Set Screws	
(Freight allowed up to but not exceeding 50c. per 100 lb.)	
	Per Cent Off List
Milled cap screws.....	80 and 10
Milled standard set screws, case hardened.....	50 and 5
Milled headless set screws, cut thread.....	50
Upset hex. head cap screws, U.S.S. thread.....	80, 10 and 10
Upset hex. cap screws, S.A.E. thread.....	80, 10 and 10
Upset set screws.....	80, 10 and 5
Milled studs	70 and 5

Chicago

Plates, Shapes and Bars Decline—1150 Cars Placed—Furnace Blown In

CHICAGO, Feb. 8.—Ingot production in the Chicago district is steadily increasing, but prices of finished steel products are easier. A 2c. price on plates, shapes and bars applies principally in outside territory, which has been made highly competitive by lower quotations from producers to the East. The general run of business in and close to Chicago is still at 2.10c., when orders call for mixed shipments of cut-to-length material. If a buyer is willing to take delivery at the convenience of the producer and if requirements cover a narrow range of steel products in mill lengths, the price is 2c., Chicago.

The Steel Corporation has blown in another blast furnace at Gary, the second in two weeks. The foremost producer now has 17 furnaces in blast out of 27, and the total count for the district is 26 active out of 36 steel works stacks. The Inland Steel Co. is operating at a reduced rate in its sheet mills while a change-over is being made from the old to a new sheet bar mill. In the meantime ingot production will be maintained at capacity and operating schedules on the structural, rail and bar mills will be increased. The rate of ingot output for the Chicago district as a whole now stands at close to 85 per cent. Bar mills are 90 per cent engaged, and rail mills are on an 85 per cent basis.

Specifications for finished steel products are heavy. Tank makers are ready to take out plates recently purchased, and forgers are operating on heavier schedules. Railroad equipment awards include 1150 freight cars and 500 sets of underframes and superstructures. Fresh inquiry calls for 1335 freight car underframes and a like number of superstructures for box cars. The Great Northern is in the market for 500 box cars, 14 tank cars and 12 locomotive tenders. Two Western railroads will take bids on 22 locomotives.

Pig Iron.—This market is not active, and prices have been given no real test. Purchases of 500 to 800 tons have been made at \$20.50, base local furnace, but five distress carloads of Northern iron were sold in Chicago at \$20, base. A Chicago furnace quoted \$18.50, base, or \$20.65, delivered, on an inquiry near the Ohio River. The business was closed with an Ohio furnace. A user in St. Paul has closed for 500 tons of Northern iron and the St. Paul railroad is asking for 500 tons for delivery at Milwaukee. An order for 150 tons of low phosphorus brought \$31.50, delivered Chicago, and an inquiry for this commodity calls for 100 tons. All told, the Chicago pig iron market lacks strength. Buying and inquiry are on a light scale, and present quotations are not steady. Shipments are a trifle heavier than a week ago.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$20.50
Northern No. 1 foundry, sil. 2.25 to 2.75	21.00
Malleable, not over 2.25 sil.	20.50
High phosphorus	20.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	27.04
Southern No. 2 (all rail)	24.01
Southern No. 2 (barge and rail)	22.18
Low phos., sil. 1 to 2 per cent, copper free	\$31.50 to 32.50
Silvery, sil. 8 per cent.	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Ferroalloys.—It is reported here that a large domestic producer of spiegeleisen is out of the market for February. Buyers are being offered foreign material at \$37 to \$38, New Orleans. The freight rate to Chicago is \$7.56. Specifications for 50 per cent ferrosilicon and for ferromanganese are in good volume.

We quote 80 per cent ferromanganese, \$107.56, delivered Chicago; 50 per cent ferrosilicon, \$85, delivered; spiegeleisen, 15 to 22 per cent, \$44.56, delivered Chicago.

Plates.—The Chicago market on plates is 2c. to

2.10c., depending upon the attractiveness of the business. Most individual orders from the general trade are small, calling for mixed sizes and for delivery at the earliest convenience of producers, and for business of this kind 2.10c. is being obtained. Competition from the East is keen, and Chicago producers have been forced to lower their prices \$2 a ton in outlying territory. Specifications from car builders and tank makers are large, and mill schedules are more favorably arranged for economical production than has been the case for some time past. Some mills are now booked six to seven weeks ahead, though the average for the district is three weeks. A steel pipe line for Minneapolis calls for 2000 tons. Orders for freight cars total 1150, 1000 being for the Burlington and 150 for the Santa Fe. Outstanding inquiry is light, amounting to about 1500 freight and 45 passenger cars. The Illinois Central, which at various times has been reported as coming into the market for close to 9000 cars, has not issued a definite inquiry.

The mill quotation on plates is 2c. to 2.10c. per lb. base, Chicago.

Structural Material.—Chicago producers, in order to meet competition from the East and to book attractive business, are naming 2c. to 2.10c. as the range of Chicago base prices for structural material. The size of the order has little bearing on the price asked, but range of sizes, length and delivery expected are the deciding factors. Fabricating awards are not large, but active inquiry in Chicago includes 4400 tons for the Woodlawn Theater, 5500 tons for the Medinah Athletic Club and 5000 tons for the Chicago Daily News Building, a total of 15,000 tons. In prospect, but nevertheless taking definite form, are 22,000 tons for an opera house and office building, 15,000 tons for the Board of Trade Building, 15,000 tons for a post office, 14,000 tons for a city and county building and 21,000 tons for the first section of the Agricultural Mart, a total of 87,000 tons. Competition among fabricators is keen, and going bids are low.

The mill quotation on plain material is 2c. to 2.10c. per lb. base, Chicago.

Bars.—Mild steel bars are being quoted at 2c. to 2.10c., Chicago, depending upon the desirability of the tonnage. In general, producers are interested in orders for mill lengths and of few sizes, and for business of that kind they are willing to take \$2 a ton below the schedule of a week ago. Orders specifying a wide range of sizes and odd lengths are accepted at 2.10c., Chicago. In outlying territory 2c. is the ruling price, this having been established to hold trade that was threatened by lower prices at Pittsburgh. Specifications for soft steel bars are fully 30 per cent heavier than last week, and mills in this district have speeded up to 90 per cent of capacity. Both new buying and shipments are close to the tonnage received on specifications. Orders from the railroad car builders are noteworthy in size, and forgers, who work hand in hand with the automotive industry, are now among the largest users of bars. Specifications and new buying by agricultural machinery builders are larger, but have been influenced more by recent orders for export trade than by a quickening in the demand for farm equipment at home. One producer of alloy steel bars is operating close to full capacity as a result of an upturn in demand. The iron bar market is quiet, and quotations are steady at 2c., Chicago. In rail steel bars, specifications are holding steady, but sales are a trifle heavier. Backlogs account for five to six weeks of operation, but mill schedules are so arranged that buyers are well taken care of on the question of delivery. The demand for fence posts is not up to the expectations of the trade and is below that of the first week of February a year ago. Arrangements have been made with Chicago reinforcing bar warehouses so that hereafter they will take orders for hard steel reinforcing bars. On this business mills are expected to maintain a spread of about \$4 between their product and billet steel bars. For reinforcing bars in quantities of 100 tons, or over, 2.10c., Chicago, will be quoted, but quotations to the general manufacturing trade remain at 1.90c. to 2c., Chicago.

The prices per lb. are: Mild steel bars, 2c. to 2.10c. base, Chicago; common bar iron, 2c. base, Chicago; rail steel bars, 1.90c. to 2c. base, Chicago.

Rails and Track Supplies.—Rail mill operations in this district have been stepped up and now stand at 85 per cent of capacity. With large railroads covered for spring delivery, rail purchases from now on through spring are expected to be small. On the other hand, it is estimated by the trade that fully 100,000 tons of track accessories are still to be placed in this territory. Production of track supplies here is at 60 per cent of capacity, and the tendency is to increase. This rate is below that of a year ago as a result of the completion of a track accessory plant by the Tennessee Coal, Iron & Railroad Co. Orders taken by that company are no longer made up at Chicago. Several Western railroads have entered orders for 8000 tons of track accessories, 10 per cent of the tonnage being angle bars.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, \$36 to \$38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. per lb. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c. mill; angle bars, 2.75c. mill.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. is low bidder at \$35, base Birmingham, on 7500 tons of 6 to 16-in. pipe for Duluth, Minn. The freight rate is \$11. James B. Clow & Sons have taken 700 tons of 12-in. Class D pipe, and the Lynchburg Foundry Co., 1000 tons of 6, 8 and 16-in., Classes B and D, for Pontiac, Mich. Fort Dodge, Iowa, has awarded 300 tons to the McWane Cast Iron Pipe Co., and the United States company has taken 4200 tons of 6-in. Class B and 16-in. Class C pipe for Detroit. Dearborn, Mich., will open bids on Feb. 9 on 2000 tons of 6, 8 and 12-in., Classes B and C. Prices are showing greater strength, and some small business has been placed at \$1 above present quotations. There are, however, a few sizes still in stock, and some makers have low spots to fill on their books.

We quote per net ton, delivered, Chicago, as follows: Water pipe, 4-in., \$47.70 to \$49.20; 6-in. and over, \$43.70 to \$45.20; Class A and gas pipe, \$4 extra.

Reinforcing Bars.—Some of the dealers who have heretofore taken orders only for billet steel bars are now handling rail steel reinforcing bars also. The rail steel is being quoted at about \$4 less than the present schedule on billet steel reinforcing bars. Hard steel bars are not being stocked in warehouses, but orders are being taken for mill delivery at 2.10c. per lb., Chicago, for lots over 100 tons each, at 2.25c. for 25 to 100 tons, at 2.40c. for 5 to 25 tons, and at 2.55c. for less than 5 tons. Fresh inquiry is in larger volume, and dealers believe that conditions are favorable to heavier shipments in February. Three large projects, the Cook County jail addition, the Waukegan, Ill., filtration plant, and the Knights of Columbus club house, Chicago, are active. General contracts for Illinois road work are being placed, and contractors are making arrangements for reinforcing steel, which averages 10 tons per mile. Chicago warehouse prices on billet steel reinforcing bars are steady at 2.30c. to 2.75c. per lb.

Sheets.—This market is quiet, and prices are weak.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.10c.
Mild steel bars.....	3.00c.
Reinforcing bars, billet steel.....	2.30c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Hoops.....	4.15c.
Bands.....	3.65c.
No. 24 black sheets.....	3.05c. to 3.15c.
No. 10 blue annealed sheets.....	2.40c. to 2.45c.
No. 24 galvanized sheets.....	3.90c. to 4.00c.
Standard railroad spikes.....	3.55c.
Track bolts.....	4.55c.
Structural rivets.....	3.50c.
Boiler rivets.....	3.70c.

Per Cent Off List

Machine bolts.....	50 and 5
Carriage bolts.....	47½
Coach or lag screws.....	55 and 5
Hot-pressed nuts, squares, tapped or blank,	
3.25c. off per lb.	
Hot-pressed nuts, hexagons, tapped or blank,	
3.75c. off per lb.	
No. 8 black annealed wire, per 100 lb.....	\$2.30
Common wire nails, base per keg.....	3.05
Cement coated nails, base per keg.....	3.05

Chicago prices on black sheets range from 2.95c. to 3.05c., and for the blue annealed from 2.35c. to 2.45c. Production in this district is at 60 to 65 per cent of capacity, and deliveries range from one to four weeks, depending upon the product. The Inland Steel Co. will operate at a low rate for the next two or three weeks, during which time a change-over will be made from the old to the new sheet bar mill.

Chicago delivered prices from mill at 2.95c. to 3.05c. for No. 24 black; 2.35c. to 2.45c. for No. 10 blue annealed; 3.90c. to 4c. for No. 24 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Wire Products.—Mild weather throughout the Central States has revived interest in spring demand, and orders this week show an improvement. Jobbers are entering larger orders for wire nails, and the railroads are also taking larger quantities of that commodity. Specifications from the manufacturing trade are steady. On the whole, both new buying and specifications are lighter than a year ago at this time, and users are still inclined to take wire products in close conformity with immediate requirements.

Bolts, Nuts and Rivets.—Specifications from buyers who have contracts are somewhat heavier, but individual orders are small and indicate that users will take only immediate requirements. A fair amount of spot buying is coming before the trade, and this business is being taken at the full schedule.

Coke.—Shipments are holding to the rate of late January, and contract prices are steady at \$9.75, local ovens, or \$10.25, delivered in the Chicago switching district. Spot orders are more numerous and are being taken at 50c. above the contract schedule.

Old Material.—Users are taking a fair amount of scrap, but orders are small and dealers are under pressure to place tonnage as it comes on track. There is no need for inquiry on the part of purchasers, sellers being at hand with offerings of practically all grades at prices below the level of a week ago. Orders taken recently for borings are large, but consumption is moderate and there appears to be little or no difficulty in making the supply, which is small at this time, meet current requirements. Heavy melting steel has been sold to a user at \$13.50 per gross ton, but offers made at that price late in the week have been turned down. Cast iron carwheels have brought \$15.50 per gross ton, but the price is easier and the demand very light.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items, except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

Per Gross Ton

Heavy melting steel.....	\$13.00 to \$13.50
Frogs, switches and guards, cut	
apart, and miscellaneous rails.....	14.50 to 15.00
Shoveling steel.....	13.00 to 13.50
Hydraulic compressed sheets.....	11.50 to 12.00
Drop forge flashings.....	9.50 to 10.00
Forged cast and rolled steel car-	
wheels.....	17.00 to 17.50
Railroad tires, charging box size	17.00 to 17.50
Railroad leaf springs, cut apart..	17.00 to 17.50
Steel couplers and knuckles.....	16.00 to 16.50
Coil springs.....	17.00 to 17.50
Low phosphorus punchings.....	15.50 to 16.00
Axle turnings, foundry grade.....	13.50 to 14.00
Axle turnings, blast fur. grade..	10.50 to 11.00
Relaying rails, 56 to 60 lb.....	25.50 to 26.50
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Rerolling rails.....	16.00 to 16.50
Steel rails, less than 3 ft.....	16.50 to 17.00
Iron rails.....	13.50 to 14.00
Cast iron borings.....	10.00 to 10.50
Short shoveling turnings.....	10.00 to 10.50
Machine shop turnings.....	7.00 to 7.50
Railroad malleable.....	16.00 to 16.50
Agricultural malleable.....	14.75 to 15.25
Angle bars, steel.....	15.50 to 16.00
Cast iron carwheels.....	15.00 to 15.50

Per Net Ton

No. 1 machinery cast.....	16.50 to 17.00
No. 1 railroad cast.....	15.50 to 16.00
No. 1 agricultural cast.....	14.25 to 14.75
Stove plate.....	14.00 to 14.50
Grate bars.....	13.50 to 14.00
Brake shoes.....	12.50 to 13.00
Iron angle and splice bars.....	14.00 to 14.50
Iron arch bars and transoms.....	18.50 to 19.00
Iron car axles.....	22.00 to 22.50
Steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	12.25 to 12.75
No. 2 railroad wrought.....	11.75 to 12.25
No. 1 busheling.....	10.25 to 10.75
No. 2 busheling.....	7.00 to 7.50
Locomotive tires, smooth.....	16.50 to 17.00
Pipes and flues.....	8.50 to 9.00

New York

Rate of Steel Buying Unchanged—Pig Iron Gives Further Ground

NEW YORK, Feb. 8.—Sales of pig iron by local brokers during the past week totaled 15,000 tons, or about the same as in the previous week. Competition for tonnage is even sharper than heretofore, and further concessions in prices have been made. While Buffalo foundry iron is generally quoted at \$18, furnace, this figure has been shaded 25c. and 50c. a ton and silicon differentials have been waived. Likewise the base price of \$21, furnace, on eastern Pennsylvania iron is proving more flexible in areas where competition from other producing centers is encountered. The New York State furnaces east of Buffalo are also pressing for business. Melters in increasing number are coming into the market because they regard it as a good time to buy. Prices are low, and there is the feeling that the impending coal strike may prove more of a market factor than is now generally conceded. It is also appreciated that if steel business improves, steel company furnaces now pressing for pig iron tonnage will withdraw from the market. One large melter that recently bought considerable pig iron contemplates buying additional tonnage merely as an investment. The New York Air Brake Co., which has closed for 500 tons of foundry and 1000 tons of malleable for its Watertown, N. Y., works, is understood to have divided the business between the Genesee furnace and a Buffalo producer. The American Locomotive Co. has placed a total of 1950 tons for second quarter, of which 400 tons was for Dunkirk, N. Y., 800 tons for Schenectady, N. Y., and 750 tons for Richmond, Va. All of it was foundry except 100 tons of charcoal for Richmond. The Crane Co., Bridgeport, Conn., has closed for 2000 tons of foundry for prompt shipment. The General Electric Co. is in the market for 400 tons of No. 1X for Lynn, Mass., 350 tons of the same grade for Everett, Mass., and 400 tons of No. 2X for Schenectady, all for March and April delivery. The Burnham Boiler Corporation, Irvington, N. Y., is sounding out the market, although it has issued no inquiry. A New Jersey melter is considering the purchase of about 2500 tons of foundry for second quarter.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices, \$1.39 to \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.54 from Virginia:

East. Pa. No. 2 fdy., sil. 1.75 to 2.25	\$22.39 to \$23.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.89 to 24.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	23.39 to 24.52
Buffalo fdy., sil. 1.75 to 2.25 (all rail)	22.41 to 22.91
No. 2 Virginia fdy., sil. 1.75 to 2.25	26.54 to 27.04

Finished Steel.—A reduction in prices of wire products, following weeks of sporadic concessions, has been announced by some mills, making the new price \$2 a ton below those which until recently had been maintained with a fair degree of firmness for about a year and a half. Wire nails are now quoted at 2.55c. and plain wire at 2.40c., per lb., Pittsburgh base. Weakness continues in sheets and hot and cold rolled strip steel, but there is a little less aggressiveness in selling at the extremely low prices of recent weeks. Most of the larger producers of sheets are now quoting 2.20c. on blue annealed, 2.80c. to 2.90c. on black and 3.75c. on galvanized, Pittsburgh base, but some sales have been made at \$1 a ton under these prices. Common quotations on hot rolled strip range from 1.90c., Pittsburgh, for pickled stock to 2c. or 2.10c. on light gages, Pittsburgh or Cleveland, while on cold rolled strip the range is 2.80c. and upward, Pittsburgh. Steel bars are 1.90c., Pittsburgh, for carload lots and 2c. for smaller lots, with large consumers, such as concrete bar distributors, insistent on something better than the minimum published prices. The spread on structural shapes continues from 1.80c. to 1.90c., Pittsburgh, with quotations on fabricated material lower than these prices would indicate, the explanation being that fabricators are sacrificing profits in their urgent need for tonnage.

In view of the price declines in other products, buyers of plates have been sounding the market more carefully for signs of weakness in this product, but apparently without success. Some mills have reiterated their stand for 1.90c., Pittsburgh, instructing their branch offices to consider no business at less than that figure. Railroads have contributed a fairly large proportion of the plate orders of the past week. Weakness in the general price structure has tended to restrict buying, as is usually the case. The mills, hoping for an upturn in volume of business that will strengthen the market, are not disposed to protect buyers for more than this quarter at current quotations, and buyers prefer not to anticipate their requirements while the price situation is unsettled. The first week of February has brought no change in the rate of steel buying.

Bookings of fabricated structural steel in the metropolitan area during January, as reported to the Structural Steel Board of Trade, Inc., New York, amounted to 50,100 tons. This was a sharp increase

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes.....	3.34c.
Soft steel bars and small shapes.....	3.24c.
Iron bars.....	3.24c.
Iron bars, Swedish charcoal.....	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons.....	4.00c.
Flats and squares.....	4.50c.
Cold-rolled strip, soft and quarter hard..	5.75c.
Hoops.....	4.49c.
Bands.....	3.99c.
Blue annealed sheets (No. 10 gage).....	3.89c.
Long terme sheets (No. 24 gage).....	5.80c.
Standard tool steel.....	12.00c.
Wire, black annealed.....	4.50c.
Wire, galvanized annealed.....	5.15c.
Tire steel, 1½ x ½ in. and larger.....	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger.....	3.65c.
Open-hearth spring steel, bases.....	4.50c. to 7.00c.
Per Cent Off List	
Machine bolts, cut thread.....	40, 10 and 10
Carriage bolts, cut thread.....	30 and 10
Coach screws.....	40, 10 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.....	\$17.33
Seamless steel, 2-in.....	20.24
Charcoal iron, 2-in.....	25.00
Charcoal iron, 4-in.....	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt.....	46	29
¾-in. butt.....	51	37
1-in. butt.....	53	39
2½-6-in. lap.....	48	35
7 and 8-in. lap.....	44	17
11 and 12-in. lap.....	37	12
Wrought Iron—		
½-in. butt.....	4	+19
¾-in. butt.....	11	+9
1-1½-in. butt.....	14	+6
2-in. lap.....	5	+14
3-6-in. lap.....	11	+6
7-12-in. lap.....	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box.....	\$6.45	\$6.20
Charcoal, per box—	A	AAA
IC.....	\$9.70	\$12.10
IX.....	12.00	14.25
IXX.....	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating.....	\$10.00 to \$11.00
IC—30-lb. coating.....	12.00 to 13.00
IC—40-lb. coating.....	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20.....	4.00c.
No. 22.....	4.15c.
No. 24.....	4.20c.
No. 26.....	4.30c.
No. 28*	4.45c.
No. 30.....	4.70c.

Sheets, Galvanized

	Per Lb.
No. 14.....	4.35c. to 4.60c.
No. 16.....	4.45c. to 4.70c.
No. 18.....	4.60c.
No. 20.....	4.75c.
No. 22.....	4.80c.
No. 24.....	4.95c.
No. 26.....	5.20c.
No. 28*	5.45c.
No. 30.....	5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

over December, when 32,500 tons were reported, and compares with 16,000 tons in January, 1926. These figures do not include bridges, subways or elevated work.

We quote mill shipments, New York delivery, as follows: Soft steel bars, 2.24c. to 2.34c. per lb.; plates, 2.19c. to 2.24c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.24c.

Cast Iron Pipe.—The volume of private inquiry for gas and water pipe is increasing, but sizable business with municipalities has not yet developed. On the recent New York opening of contractors' bids for laying about 200 tons of water pipe, the Beaver Engineering & Contracting Co., New York, was low bidder. Orchard Park, N. Y., will open bids Feb. 11, on about 2000 tons of 6 and 8-in. water pipe for a new waterworks, including 32,000 ft. of 6-in. Class C, 36,000 ft. of 8-in. Class B, 19,000 ft. of 8-in. Class C, and 100 tons of fittings. Florham Park, N. J., opens bids Feb. 23, on about 750 tons of 4, 6 and 8-in. water pipe included in contractors' bids. Prices continue low but fairly firm, particularly on the smaller sizes.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, \$48.60 to \$50.60; 4-in. and 5-in., \$53.60 to \$55.60; 3-in., \$63.60 to \$65.60; with \$5 additional for Class A and gas pipe.

Ferroalloys.—The ferromanganese market is exceedingly quiet and is nearly bare of inquiries or sales of even small or carload lots. A few of these, however, are moving each week at unchanged prices. In spiegeleisen activity is also limited, but prices are firm. Specifications on contract for these and other alloys are fairly satisfactory.

Reinforcing Bars.—Several jobs have been let in the last week, the largest being the Stamford, Conn., High School, for which the Truscon Steel Co. will supply 350 tons of bars. On the whole, however, business is showing little improvement over January. The tonnage involved in jobs being estimated is large and is increased this week by the Hudson River bridge at Poughkeepsie, which will require several hundred tons for floor slabs.

Mill prices on billet steel reinforcing bars are: 2.10c. per lb. base, Pittsburgh, on lots of less than 100 tons and 2c. base, on large lots. Reinforcing bars out of New York warehouse are quoted at 3.15c. per lb., delivered at job, and out of Youngstown warehouse, at 2.50c., Youngstown, or 2.87½c., delivered New York.

Coke.—Standard foundry coke is holding steadily at \$4.25 to \$4.75 per ton, Connellsville, for prompt shipment tonnages, and standard furnace is strong, showing a slight advance to a range of \$3.25 to \$3.75 per ton, Connellsville. There is very little prompt shipment furnace coke available, and because of the possibility of a coal strike, sellers are not inclined to contract for delivery of either furnace or foundry beyond April 1. Delivered prices of foundry coke are: To northern New Jersey, \$8.28 to \$9.28; New York or Brooklyn, \$9.04 to \$10.04; Newark or Jersey City, N. J., \$8.16 to \$9.16 per ton. By-product foundry coke is quoted at \$9.59 to \$10.77 per net ton, delivered Newark or Jersey City, N. J.

Warehouse Business.—As a result of recent mill reductions in the prices of black and galvanized sheets, jobbers have reduced the warehouse schedule by 15c. per 100 lb. to 4.20c. per lb., base, for black and 4.95c. per lb., base, for galvanized. Some sellers of Nos. 14 and 16-gage galvanized continue to quote these heavy gages on a 25c. per 100 lb. higher base. Softness has developed recently in machine bolts and coach screws, with an extra 10 per cent off list being offered.

Old Material.—The movement of prices on all grades of scrap continues steadily downward. No. 1 heavy melting steel is still being purchased at \$15 per ton, delivered eastern Pennsylvania, but some brokers without orders in hand are offering only \$14.50 per ton for this delivery. Yard steel is quoted at about \$12.50 per ton, delivered to consumers in Pottsville, Phoenixville or Harrisburg, Pa. Borings and turnings are being purchased at \$11 to \$11.50 per ton, delivered, depending upon the freight rate. Machine shop turnings and cast borings are also being purchased at about \$11.50 per ton, delivered. Specification pipe is quoted at \$13.50

per ton, delivered to a consumer at Lebanon, Pa. Other consumers of pipe are not active in the present market.

Buying prices per gross ton, New York, follow:

Heavy melting steel.....	\$11.25 to \$12.35
Heavy melting steel (yard).....	8.50 to 8.75
Rails for rolling.....	12.00 to 12.50
Steel car axles.....	16.50 to 17.00
Iron car axles.....	24.00 to 24.50
No. 1 railroad wrought.....	12.50 to 13.50
No. 1 yard wrought, long.....	11.50 to 12.50
Forge fire.....	8.50 to 9.00
Cast borings (steel mill).....	8.25 to 8.75
Cast borings (chemical).....	12.50 to 13.00
Machine shop turnings.....	7.75 to 8.25
Mixed borings and turnings.....	7.75 to 8.25
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	9.75
Stove plate (steel mill).....	8.75 to 9.25
Stove plate (foundry).....	10.50 to 10.75
Locomotive grate bars.....	9.75 to 10.25
Malleable cast (railroad).....	14.00 to 14.25
Cast iron carwheels.....	11.50 to 12.00
No. 1 heavy breakable cast.....	11.75 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$15.00 to \$15.50
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	12.50 to 14.00
No. 2 cast (radiator, cast boilers, etc.).....	12.50 to 13.00

Cleveland

Further Breaks in Pig Iron Prices— Sheets Show Greater Stability

CLEVELAND, Feb. 8.—Mills continue to enter a fair volume of business for finished steel, but consumers of all mill products are confining their orders to early requirements and are showing no disposition to place contracts for future delivery. While orders from the automotive industry in Detroit show a gain, new demand from that source so far this month has been hardly up to expectations. Increased business from motor car builders is more noticeable in sheets than in other products. While automobile builders appear optimistic, they are closely restricting their purchases and not buying much steel for delivery beyond February, although they are placing some orders for March shipment of full finished sheets and other products that require a longer time than others for various manufacturing operations.

With little building work coming out in this territory, new demand for structural material is light. Plates are moving fairly well in car lots. The American Shipbuilding Co. has taken a contract for two oil tankers for the Standard Oil Co. These will require 1200 tons of plates, which have been placed with a Pittsburgh district mill. The Nickel Plate railroad has purchased 5000 kegs of spikes and 1200 kegs of track bolts, this business being distributed between two or more mills, and it is in the market for 250,000 tie plates.

The most important price changes during the week were \$2 a ton reductions on wire products and wire rods. On steel bars and structural material 1.90c., Pittsburgh, has become a more common price, although some small-lot sales are being made at 2c. The local mill price on bars is unchanged at 1.50c. to 2c., Cleveland. Sheet prices have become fairly well stabilized around recent levels.

Pig Iron.—Sales increased in the past week, during which Cleveland interests sold approximately 40,000

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes.....	3.00c.
Mild steel bars.....	3.00c.
Cold-finished rounds and hexagons.....	3.90c.
Cold-finished flats and squares.....	4.40c.
Hoops and bands.....	3.65c.
No. 24 black sheets.....	3.65c.
No. 10 blue annealed sheets.....	3.15c.
No. 24 galvanized sheets.....	4.50c.
Cold-rolled strip.....	*5.95c.
No. 9 annealed wire, per 100 lb.....	\$3.00
No. 9 galvanized wire, per 100 lb.....	3.45
Common wire nails, base, per keg.....	3.00

*Net base, including boxing and cutting to length.

tons of foundry and malleable iron. New breaks in prices have developed in Cleveland and the Valley district. At least one Valley producer, evidently spurred by the competition of Cleveland furnaces in southern Ohio and Indiana, is now quoting foundry iron at \$18, furnace, or a reduction of 50c. a ton. Cleveland producers have reduced their prices on foundry and malleable iron for local delivery 50c. a ton to \$18.50 at furnace, putting it at a delivered price that would be well below that from the Valley should Valley furnaces go to \$17.50. Several Cleveland foundries have covered at the new price. For out-of-town shipment, \$17.50, furnace, which has been quoted for two or three weeks, has become more of an open price, although \$18 is being asked for delivery to some less competitive outside points. Other Lake furnaces are holding closely to recent prices. In Michigan, the ruling quotation is \$19.50, furnace, but this is being shaded 50c. for shipment to certain sections. Basic iron is untested, but it is believed that \$17.50, Valley, more nearly represents the market than the asking price of \$18. The American Steel Foundries has an inquiry out for 2500 to 4000 tons of basic iron for its Alliance, Ohio, plant, which is expected to reveal the present market condition of this grade. With the increase in operation by Michigan automobile plants, shipping orders from that industry show an encouraging gain this month. The General Motors Corporation, which has under construction a large Buick foundry at Flint, Mich., and other foundry extensions, has advised the trade that with the increase of its foundry capacity it will require after July 1 at least 150,000 tons of pig iron per annum. One-half of that amount is now taken care of by long-term contracts, and it expects to buy the remainder of its requirements over six-month or 12-month periods. This corporation has not yet issued a definite inquiry for the additional iron.

Quotations below are per gross ton and except on basic and low phosphorus iron, are delivered Cleveland, including a 50c. switching charge for local iron. Ohio silvery and Southern iron prices are based on a \$3 freight rate from Jackson and \$6 from Birmingham.

Basic, Valley furnace.....	\$17.50 to \$18.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25.....	19.00
Southern fdy., sil. 1.75 to 2.25.....	24.00
Malleable.....	19.00
Ohio silvery, 8 per cent.....	31.50
Standard low phos., Valley furn.....	28.00

Bolts, Nuts and Rivets.—Orders for bolts and nuts showed some further gain during the week, not only from the automotive but from some of the other consuming industries. Regular discounts are being maintained. The demand for rivets has declined. Small lots are bringing the commonly quoted price of \$2.60 per 100 lb.

Semi-Finished Steel.—Orders for sheet bars show some gain over last month. The market is apparently established at \$34, Cleveland and Youngstown, and a local mill is asking the same price for billets and slabs. Wire rods have declined \$2 a ton to \$43, Cleveland.

Sheets.—Demand showed some further gain the past week both from the automotive industry and from other consumers. The market has a slightly firmer tone. At least prices are no lower than they have been, and some of the mills are not inclined to name the extreme quotations that recently appeared on blue annealed sheets. In spite of the present low prices, consumers are buying only for immediate needs. Most producers in this territory continue to quote on an Ohio mill base. On black sheets 2.80c. to 2.90c., mill, is the usual range, although there are still reports of 2.75c. for an attractive order. On blue annealed sheets 2.10c., mill, is still being named as an extreme price, but the common range is from 2.20c. to 2.30c., mill. Owing to an error in telegraphic transmission 2c., Pittsburgh, was given in this report last week as the common price on blue annealed sheets. This should have been 2.20c. Galvanized sheets are unchanged at 3.75c., mill. Automobile body sheets are firm.

Strip Steel.—The market on wide hot-rolled strip steel continues weak, with a good deal of irregularity in prices. Manufacturers contend that the wide range in quotations is due in large measure to the present extras, which they regard as obsolete because of the improvement in manufacturing operations. Much of

the business is being taken at net delivered prices, and in some cases where there are good extras it is stated that these figure back to as low as a 1.75c., base. Narrow strip is quoted at 2.30c., Pittsburgh. Cold-rolled strip continues weak, with 3c., Cleveland, evidently the top of the market except for small lots. Tube stock is quoted at 2.75c., Cleveland, and fender stock at 4.40c. to 4.50c.

Wire Products.—A \$2 a ton reduction from the recent regular prices has been made, effective Feb 7. This applies to all wire products except field fence. Concessions from former prices have appeared recently in some sections, particularly in Detroit. The new prices are \$2.55 per keg for nails and \$2.40 for plain wire, in car lots, f.o.b. Cleveland.

Alloy Steel.—The market is showing moderate activity. Several orders for fair-sized lots of 3½ per cent nickel and chrome nickel were placed during the week by Cleveland forge shops at the minimum quotations named in the published price schedule.

Reinforcing Bars.—Outside of small-lot orders, the market is almost at a standstill.

Warehouse Business.—Warehouse sales of sheets have improved since the recent price decline. Other products are moving fairly well from jobbers' stocks, and prices are firm.

Coke.—There has been a price reduction on one of the premium brands of foundry coke, but other prices are unchanged. Quotations on standard Connellsville foundry coke range from \$4 to \$5.35, ovens. Heating coke is unchanged at \$3 to \$3.25, ovens.

Iron Ore.—All-rail shipments of Lake Superior ore during 1926 amounted to 1,439,500 gross tons, making the total amount shipped from the mines by water and rail 59,970,009 tons, according to figures prepared by the Lake Superior Iron Ore Association. The amount shipped from the mines to the upper Lake docks was 58,530,509 tons, or about 7000 tons less than the amount shipped from those ports, which was 58,537,855 tons. The small difference in receipts and shipments at upper Lake docks is accounted for by a slight variation in the amount of ore that is left at the upper Lake docks at the close of the shipping season. Shipments from Lake Erie ports during January were 449,361 tons, as compared with 460,016 tons during the same month a year ago. The dock balance on Feb. 1 was 6,692,124 tons, as compared with 6,622,533 tons on the same date a year ago.

Old Material.—There was some activity in blast furnace scrap and heavy melting steel the past week, as dealers were covering against orders placed during the previous week by a Cleveland consumer. They did not find the supply of borings and turnings plentiful at \$11.75, which had been the ruling price, and paid \$12 for some of the material. A small portion of this scrap was bought in Detroit. It is said that no Detroit blast furnace scrap had previously been sold for Cleveland delivery for over a year, but the present weakness in the Detroit market and rather firm prices in Cleveland allowed the Detroit scrap to come into the city again. Dealers paid \$15 for heavy melting steel to fill outstanding orders.

We quote per gross ton delivered consumers' yards in Cleveland:

Heavy melting steel No. 1.....	\$14.50 to \$15.00
Heavy melting steel No. 2.....	14.00 to 14.50
Rolls for rolling.....	16.25 to 16.50
Rolls under 3 ft.....	18.00 to 18.50
Low phosphorus billet, bloom and slab crops.....	18.00 to 18.50
Low phosphorus sheet bar crops.....	16.50 to 17.00
Low phosphorus plate scrap.....	16.00 to 16.50
Low phosphorus forging crops.....	16.50 to 17.00
Cast iron borings.....	11.75 to 12.00
Machine shop turnings.....	9.00 to 9.25
Mixed borings and short turnings.....	11.75 to 12.00
Compressed sheet steel.....	13.75 to 14.25
No. 1 railroad wrought.....	11.50 to 12.00
No. 2 railroad wrought.....	14.50 to 14.75
Railroad malleable.....	16.00 to 16.50
Light bundled sheet stampings.....	12.00 to 12.50
Steel axle turnings.....	12.50 to 13.00
No. 1 cast.....	16.00 to 16.50
No. 1 busheling.....	12.00 to 12.50
No. 2 busheling.....	11.75 to 12.00
Drop forge flashings, 15 in. and under.....	12.00 to 12.50
Railroad grate bars.....	12.00 to 12.50
Stove plate.....	12.00 to 12.50
Pipes and flues.....	10.00 to 10.50

Philadelphia

Steel Buyers Cautious—Pig Iron More Active—New Scrap Classifications

PHILADELPHIA, Feb. 8.—Weakness in steel prices seems to have curbed the expansion in volume of business that had been expected this month. Buyers are cautious, and this attitude is reflected in orders, which are small and for immediate requirements only. A moderate increase in rollings of structural shapes is reported by one or two mills, but otherwise the improvement, if any, has not been sufficient to satisfy Eastern mills, some of which are operating at not more than 50 to 60 per cent of capacity.

A reduction in prices of wire products has become general, the new quotations being \$2 a ton below the level which was maintained for more than a year. Sheet prices have recovered slightly from the extremely low prices of recent weeks but still show irregularity. Hot-rolled and cold-rolled strip are at low levels, the former having been sold in this district at 1.90c., Pittsburgh.

Pig Iron.—Apparently satisfied that pig iron prices are as low as can be expected, buyers are placing orders a little more freely, and the business of the past week amounted to several thousand tons, perhaps as much as 10,000 in foundry grades alone. A steel company is negotiating for 5000 to 10,000 tons of basic iron. Sales of foundry iron are largely for delivery over the remainder of first half. Pig iron producers are less apprehensive as to the effects of a soft coal strike on April 1, and are not hesitating in accepting orders for delivery up to July 1 at current quotations, which range from \$21 to \$21.50, furnace, for the base grade. A large proportion of sales has been at \$21 in the past week.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$21.76 to \$22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X	22.76 to 23.26
Basic, delivered eastern Pa.	21.25 to 21.75
Gray forge	21.25 to 21.75
Malleable	22.50 to 23.00
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00
*Virginia No. 2 plain, 1.75 to 2.25 sil.	26.17 to 26.67
*Virginia No. 2X, 2.25 to 2.75 sil.	26.67 to 27.17

*The freight rate from Virginia furnaces to Philadelphia is \$5.17 per gross ton.

Ferromanganese.—Demand for ferromanganese is very light, and there is no basis for recent reports that quotations of \$105, seaboard, have been made. One producer is out of the market, and the other leading Eastern maker is quite ready to accept orders for first half at \$100, seaboard, which remains also the British price, although almost no British alloy is being sold.

Billets.—Reductions of \$2 a ton on rerolling billets by Pittsburgh and Ohio mills, making the current quotation \$33, Pittsburgh, will be met by Eastern mills on rerolling quality, but much of the Eastern business is in high carbon billets, on which, it is asserted, extras are not high enough to warrant as low a base price as \$33. Therefore, buyers who have tried to apply the new base to billets for forging purposes have met with some resistance.

Plates.—Eastern mills have taken a stand for 1.90c., Pittsburgh, on plates in answer to buyers who have attempted to obtain concessions of \$1 or \$2 a ton. The plate price has held firmly as compared with prices on other products, a situation to which buyers do not seem to be quite reconciled, and they have been sounding out the market for points of weakness. There is a fair run of orders, among which railroad buying is of prominence.

Structural Shapes.—A moderate increase in the volume of orders for shapes in the past month has given one or two Eastern mills better rolling schedules but has not changed the aspect of the market, which is that of weakness. On ordinary lots 1.90c., Pittsburgh,

is usually quoted, but on sizable lots concessions of \$2 or \$3 a ton are not unusual. Fabricators are on a keen hunt for tonnage and are making sacrifices of profits to get it.

Bars.—All mills are willing to accept carload lots of steel bars at 1.90c., Pittsburgh, but buyers are placing business with caution. Most of the mills are in need of tonnage. It is doubtful if bar capacity is being utilized at more than 50 or 60 per cent, a lower average than exists in some other products. Inquiries for concrete reinforcing bars are extremely light, considering that the spring building season is near at hand.

Sheets.—Efforts are being made by some of the sheet mills to improve the situation with respect to prices. While it is possibly true that there is less of a disposition to quote the extremely low prices of recent weeks, it cannot be said that the market has materially strengthened. Black sheets are obtainable at 2.80c. to 2.90c., Pittsburgh, with one or two mills having gone back to 3c.; galvanized sheets are generally 3.75c. but occasionally 3.70c., and blue annealed sheets are being booked at 2.20c., Pittsburgh, a price, however, which has been and still is subject to an occasional concession of \$1 or \$2 a ton. The Lukens Steel Co., Coatesville, Pa., is completing installation of sheet finishing capacity and about March 1 will offer blue annealed sheets in gages from No. 9 to Nos. 14 or 16.

Imports.—It is noteworthy that no foreign pig iron was received at Philadelphia last week, but receipts of steel were fairly large and included 1174 tons of structural steel from Belgium; 660 tons of steel blooms from France; 35 tons of steel bars and 26 tons of ingots from Sweden. Other imports were 146 tons of ferro-alloys from Switzerland and 9200 tons of chrome ore from Portuguese Africa.

Old Material.—With marked weakness prevailing in nearly all grades of iron and steel scrap, a situation of unusual importance to scrap producers and scrap dealers and brokers developed this week with the announcement by the Bethlehem Steel Co., the largest scrap consumer in the East, of new classifications of heavy melting steel and blast furnace material. There are only slight changes in the grading of No. 1 heavy melting steel, but a secondary grade of melting steel scrap is established, which consists mainly of automobile parts, railroad car sides and cut pipe, a classification which corresponds to a degree with the official specification for No. 2 heavy melting steel adopted by the Department of Commerce in cooperation with producers, distributors and consumers. For this grade the Bethlehem Steel Co. will pay \$1.50 per ton under the ruling price for No. 1 heavy melting steel. Four grades of blast furnace scrap are established. Details of the new specifications will be found on page 449 of this issue. The current market for No. 1 heavy melting steel is \$14.50 to \$15, delivered, making the No. 2 grade \$13 to \$13.50. Other grades which have declined in price are machine shop turnings, bundled sheets, couplers, and the knuckles and rolled steel wheels, shafting and steel axles.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	\$14.50 to \$15.00
Scrap rails	14.00 to 14.50
No. 2 heavy melting steel	13.00 to 13.50
Steel rails for rolling	16.50 to 17.00
No. 1 low phos., heavy, 0.04 per cent and under	20.00
Couplers and knuckles	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
Cast iron carwheels	16.00 to 16.50
No. 1 railroad wrought	17.00 to 17.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	11.50 to 12.00
No. 1 blast furnace scrap	11.00
Machine shop turnings (for steel works)	11.50 to 12.00
Machine shop turnings (for rolling mill)	12.00 to 12.50
Heavy axle turnings (or equivalent)	13.50 to 14.00
Cast borings (for steel works and rolling mill)	12.50 to 13.00
Cast borings (for chemical plant)	15.00 to 16.50
No. 1 cast	17.00 to 17.50
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	12.00
Stove plate (for steel works)	12.50
Wrought iron and soft steel pipes and tubes (new specifications)	14.00 to 14.50
Shafting	19.00 to 20.00
Steel axles	21.00 to 22.00

San Francisco

Fabricated Lettings Total 18,350 Tons— 1000 Tons of German Iron Arrives

SAN FRANCISCO, Feb. 5 (*By Air Mail*).—Foremost among developments of the week have been bookings in fabricated steel totaling 18,350 tons, lettings in reinforcing bars amounting to 4619 tons, and the arrival of fresh shipments of German and Indian foundry iron and German coke. The situation in regard to prices is unchanged. In plates, 2.30c., c.i.f. Coast ports, remains the asking price so far as the larger mills are concerned, but it is generally understood that 2.25c. could be obtained on a good sized tonnage. In reinforcing bars, while mill quotations continue at 2.35c., c.i.f. Coast ports, offerings at 2.25c. are understood to have been made recently.

Pig Iron.—A local importer has received a shipment during the week of 1000 tons of German foundry iron, and it is understood that by the end of the first quarter he will have delivered to Pacific Coast users about 4000 tons of Indian foundry iron. Quotations remain unchanged.

	Per Gross Ton
*Utah basic	\$25.00 to \$26.00
*Utah foundry, sil. 2.75 to 3.25 ..	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25 ..	25.00
**German foundry, sil. 2.75 to 3.25 ..	24.25

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Shapes.—The outstanding fabricated steel letting that has been placed this year, 11,000 tons, for a general hospital in Los Angeles, was taken during the week by the Llewellyn Iron Works of that city. Bookings for the week exceed 18,000 tons, and fresh inquiries call for 9687 tons. Among pending projects, a toll bridge at San Diego, Cal., will require 5250 tons, and a theater at Portland, Ore., calling for 2000 tons is expected to come up for bids in the near future. Eastern mill quotations on plain material are firm at 2.35c., c.i.f. Coast ports.

Plates.—While no awards of 100 tons or over have been reported during the past week, lettings of less than 100-ton lots have been fairly numerous. Several good-sized tonnages are pending, but only one inquiry of importance has come out during the week, namely, 500 tons for a pipe line for the East Bay Water Co., Oakland, Cal. The Southern Pacific Co., San Francisco, has increased its recent inquiry of 830 tons to 900 tons, on which bids will close Feb. 10. Eastern mills continue to quote plates at 2.30c., c.i.f. Coast ports, but it is understood that 2.25c. is obtainable on desirable tonnages.

Bars.—Lettings for the week total 4619 tons, and fresh inquiry calls for 515 tons. The outstanding individual award, 2250 tons, for the Coolidge dam, near San Carlos, Ariz., was placed with unnamed interests through Atkinson & Spicer, Los Angeles, general contractors. In San Francisco, 700 tons for two piers for the State Harbor Commissioners, was awarded to an Eastern mill through the Healy, Tibbitts Construction Co. Local reinforcing bar jobbers quote as follows: 2.85c., base, per lb. on lots of 200 tons, and 3.10c., base, on less-than-carload lots.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. has been awarded 541 tons by San Diego, Cal., 108 tons by Palo Alto, Cal., and 373 tons by Ashland, Cal. Fresh inquiries included the following:

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars and small angles	3.00c.
Small angles, 3-in. and over	3.00c.
Small angles, under 3-in.	3.40c.
Small channels and tees, 3-in. to 2 1/2-in.	3.60c.
Spring steel, 3/4-in. and thicker	5.00c.
No. 24 black sheets	4.70c.
No. 28 black sheets	5.15c.
No. 10 blue annealed sheets	3.75c.
No. 24 galvanized sheets	5.25c.
No. 28 galvanized sheets	6.15c.
Common wire nails, base per keg	\$3.75
Cement coated nails, 100-lb. keg	3.75

Wenatchee, Wash., 380 tons of 16 and 20-in. Class B pipe; Seattle, Wash., 156 tons of 8-in. Class C pipe; Portland, Ore., 350 tons for the Powell Valley Road Water District; San Diego, Cal., 560 tons of 6, 8, 10 and 12-in. Class B pipe, on which bids will be opened Feb. 14, and 100 tons for the Highland Crest improvement project, on which bids close Feb. 7. Quotations are unchanged at \$49 to \$50, base, f.o.b. dock San Francisco.

Steel Pipe.—San Diego, Cal., has awarded 374 tons of 4 and 12-in. welded steel pipe to an unnamed company through D. H. Ryan, general contractor, and also 80 tons of 4 and 6-in. welded steel pipe to an unnamed firm through the same contractor. The pipe will be used for street improvement work. R. F. Ware, Los Angeles, general contractor for street improvement work at Rialto, Cal., has placed 366 tons of 4 and 6-in. welded steel pipe with an unnamed jobber.

Warehouse Business.—Local jobbers report slightly heavier buying in the heavier forms of steel. Quotations are unchanged.

Coke.—A local importer has received a shipment of 1500 tons of German by-product coke. All of it has been sold and will apply on first quarter contracts. None of the local importers is quoting prices except on specific inquiries.

Birmingham

Pig Iron Shipments Equal Output—Pipe Plants and Plate Shops Busy

BIRMINGHAM, Feb. 8.—Sales of foundry pig iron in Alabama are still being made at \$18 per ton, Birmingham, and aggregate bookings exceed output. That the market is firm is indicated by the fact that the smaller melters of iron, in buying from one to three cars of iron at the time for immediate delivery, are asked a premium of \$1 per ton. Sales are mainly for delivery during the first half of the year. No interest has yet been shown in third quarter requirements, although the larger melters are booking considerable business in their respective products for delivery after July 1. Shipments of pig iron are heavy; in fact, more iron will be moving shortly than is being manufactured. This means that surplus stocks on furnace yards, which are not heavy, will be drawn on. The melt of iron has picked up rapidly, especially with cast iron pressure pipe plants, some of which are operating on three shifts. No announcement has been made indicating an early increase in pig iron production, although three blast furnaces are virtually ready to be blown in. Some iron continues to be shipped out of the territory against sales made shortly after the reduction of \$2 per ton was announced.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil.	\$18.00
No. 1 foundry, 2.25 to 2.75 sil.	18.50
Basic	18.00
Charcoal, warm blast	29.00

Rolled Steel.—With few exceptions open-hearth furnaces in Alabama are in operation. Many of the finishing mills are also working to capacity. Tank makers are still engaged on old contracts and are booking additional business. The Reeves Brothers Co., Birmingham, will ship several tanks of 80,000 bbl. capacity each to Texas, while the Birmingham Tank Works has contracts for large tanks for a cotton seed oil mill company in Savannah, Ga. Other tank plants here have orders requiring a considerable tonnage in plates. Other forms of steel are also in good demand, this being particularly true of wire and nails. Mill prices are unchanged.

Cast Iron Pipe.—Three shifts of 8 hr. each have been put on in the monocast pipe shop of the American Cast Iron Pipe Co. Production has been speeded up in pipe shops generally. Efforts are now being made to ship as much pipe as possible before the spring rush of business sets in. Quotations on pressure pipe are unchanged at \$36 to \$37, Birmingham, for 6-in. and larger diameters. Reconsideration of the increase

in freight rates on pipe to the East is being sought, although most of the tonnage from this district goes to the West and Northwest.

Coke.—Moderate weather has affected both the coal and coke trades, but production is in undiminished volume. No coal is being stored, and so far very little coke has been stocked except by the iron and steel manufacturers. Prices on foundry coke continue at \$5.50 to \$6, ovens, latter price being for very small lots and for immediate delivery.

Old Material.—Prices remain stationary, but shipments are heavy and dealers are working large yard forces. Buying is at a steady rate.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel.....	13.00 to 14.00
Railroad wrought.....	11.00 to 12.00
Steel axles.....	17.00 to 18.00
Iron axles.....	17.00 to 18.00
Steel rails.....	13.00 to 14.00
No. 1 cast.....	16.00 to 17.00
Tramcar wheels.....	16.50 to 17.50
Carwheels.....	16.00 to 16.50
Stove plate.....	14.00 to 14.50
Machine shop turnings.....	8.00 to 8.50
Cast iron borings.....	8.00 to 8.50
Rails for rolling.....	15.00 to 16.00

St. Louis

Coke Higher—Plates and Shapes Weak—Scrap Declines 25c. to 50c. a Ton

ST. LOUIS, Feb. 8.—An improvement in pig iron buying was reported during the week. The local producer sold about 6500 tons, of which the largest orders were 2500 tons of foundry iron to a radiator company and 1200 tons of malleable to an Illinois shop. The market seems steady, and greater interest is being shown by melters. Prices are unchanged.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$4.42 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25..	\$22.66
Northern malleable, sil. 1.75 to 2.25	22.66
Basic.....	22.66
Southern fdy., sil. 1.75 to 2.25..	\$22.42 to 23.42
Granite City iron, sil. 1.75 to 2.25. 21.81 to	22.31

Coke.—The Granite City ovens are out of the market so far as foundry coke is concerned. Present commitments will have been shipped by March 1, when no more of this grade will be sold. They will continue to sell domestic grades. The local by-product ovens quote \$10.50 per net ton, St. Louis, for foundry coke.

Finished Iron and Steel.—The market on plates and shapes is reported to be weak, and the price of 2.10c., Chicago, is being cut, without stimulating business. Structural demand is light, and fabricators are looking for business. Railroad buying is light. Warehouse business has fallen off considerably, but the local interests regard this as only a temporary situation.

Old Material.—The market shows further weakness, and prices are off 25c. to 50c. a ton. Dealers constitute the only purchasers but are paying lower prices than formerly because their customers are staying out

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes.....	3.25c.
Bars, mild steel or iron.....	3.15c.
Cold-finished rounds, shafting and screw stock.....	3.75c.
No. 24 black sheets.....	4.45c.
No. 10 blue annealed sheets.....	3.60c.
No. 24 galvanized sheets.....	5.25c.
Black corrugated sheets.....	4.65c.
Galvanized corrugated sheets.....	5.30c.
Structural rivets.....	3.65c.
Boiler rivets.....	3.85c.
	Per Cent Off List
Tank rivets, $\frac{7}{8}$ -in. and smaller.....	.70
Machine bolts.....	.50 and 5
Carriage bolts.....	.47½
Lag screws.....	.55 and 5
Hot-pressed nuts, square, blank or tapped, 3.25c. off per lb.	
Hot-pressed nuts, hexagons, blank or tapped, 3.75c. off per lb.	

of the market, complaining that business does not justify any further buying of raw materials. Railroad lists include: Baltimore & Ohio, 25,145 tons; St. Louis-San Francisco, 1500 tons; Mobile & Ohio, 800 tons; Missouri Pacific, 350 tons; Kansas City Southern, 250 tons, and Pullman Co., St. Louis, 200 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

	Per Gross Ton
Iron rails.....	\$14.00 to \$14.50
Rails for rolling.....	15.50 to 16.00
Steel rails less than 3 ft.....	16.00 to 16.50
Relaying rails, 60 lb. and under.....	20.50 to 23.50
Relaying rails, 70 lb. and over.....	26.50 to 29.00
Cast iron carwheels.....	14.50 to 15.00
Heavy melting steel.....	12.75 to 13.25
Heavy shoveling steel.....	12.75 to 13.25
Frogs, switches and guards cut apart.....	14.25 to 14.75
Railroad springs.....	15.50 to 16.00
Heavy axle and tire turnings.....	10.25 to 10.75
No. 1 locomotive tires.....	16.75 to 17.25

	Per Net Ton
Steel angle bars.....	12.50 to 13.00
Steel car axles.....	17.25 to 17.75
Iron car axles.....	21.00 to 21.50
Wrought iron bars and transoms.....	18.00 to 18.50
No. 1 railroad wrought.....	10.75 to 11.25
No. 2 railroad wrought.....	11.50 to 12.00
Cast iron borings.....	9.00 to 9.25
No. 1 bushelling.....	10.00 to 10.50
No. 1 railroad cast.....	14.25 to 14.75
No. 1 machinery cast.....	16.00 to 16.50
Railroad malleable.....	12.50 to 13.00
Machine shop turnings.....	6.25 to 6.75
Bundled sheets.....	8.00 to 8.50

Seattle

Bridge to Take 10,000 Tons of Structural Steel—Plates and Sheets Weaker

SEATTLE, Feb. 4 (By Air Mail).—Local sales managers of Eastern steel mills and jobbers report that January was better than December in volume of steel sales, and it is expected that this month may show a further increase. For a long time, jobbers and consumers have been buying largely for nearby needs, and stocks are low and are frequently replenished.

The price structure in steel is not so strong as it was in the latter part of 1926, and there is more disposition to shade prices to secure orders. Plates are off about \$1 per ton, while sheets are very weak and it is hard to say just what prices are ruling. Buyers are cautious in placing orders, and the opinion is that if any desirable business comes out, lower figures on some forms of steel are probable.

Building construction has slowed down, and it is not regarded as likely that the record of 1926 will be maintained this year.

Pig Iron.—Only very small lots are being bought, and some foreign iron is coming into this and other nearby consuming points. We quote Utah basic and foundry iron at about \$25 per gross ton, Seattle, but this price might be shaded.

Shapes.—New inquiry and orders have quieted down somewhat, but prices on shapes are firm. Some low figures are being made on fabricated work, in some cases possibly below actual costs. The Minneapolis Steel & Machinery Co., from its Butte offices, has taken 965 tons for buildings for the Sullivan Mining Co., at Kellogg, Idaho. Two bridges are up calling for 500 to 600 tons. A bill has been signed for the erection by the Government of a Columbia River bridge, calling for about 10,000 tons, and it is expected that bids will be asked in two to three months. Bids will be opened on Feb. 15 for 600 tons for the Hoquiam River bridge. We quote shapes at 2.35c., c.i.f. Seattle.

Plates.—Prices are lower, and while 2.20c., c.i.f. Coast ports, has been done in some cases, it is now stated that 2.25c. is bottom of the market on carloads or larger lots and 2.30c. on small lots. Bids are to open Feb. 4 for 1500 tons for water mains at Spokane, and it is likely some low prices will come out. This is the only large job in sight. Eastern mills continue to quote plates of tank quality at 2.25c. to 2.30c., c.i.f. Seattle.

Track Materials.—The local office of an Eastern

Warehouse Prices, f.o.b. Seattle

	Base per Lb.
Plates and structural shapes.....	3.00c.
Angles, bar sizes.....	3.00c.
Angles, structural.....	3.00c.
Hoops.....	5.00c.
No. 10 blue annealed sheets.....	4.25c.
No. 24 black sheets.....	4.90c.
No. 24 galvanized sheets.....	5.75c.
Rivets, tank.....	.50 per cent off list
Wire nails, base, per 100-lb. keg.....	\$3.20
Reinforcing bars.....	2.90c.

rail mill has sold 3500 tons of 70-lb. rails to the Weyerhaeuser Timber Co. for delivery over the next three or four months. The Southern Pacific is in the market for 2750 kegs of standard railroad spikes, bids on which are to be opened about Feb. 15. Prices on standard-size spikes range from \$3 to \$3.10 per 100-lb. keg, f.o.b. Seattle.

Sheets.—The local sheet market is somewhat demoralized, low prices being named by several Eastern mills. Demand is not active, being mainly for galvanized. Quotations have declined to 4.20c., Seattle, for No. 24 gage galvanized, 3.35c. for No. 24 black and 2.70c. for No. 10 blue annealed.

Bars.—The local market on deformed bars is somewhat weaker because of low prices quoted on foreign bars and also by nearby makers. The Pacific Coast Steel Co. has taken 600 to 700 tons for the new local Rhodes Arcade building and 450 tons for the Republic Building, Seattle.

Hoops and Bands.—Prices are lower, and demand is only fair, being mostly for small lots for quick shipment. For large lots hoops and bands are quoted at 2.90c. per lb., f.o.b. Seattle.

Wire Products.—New demand for wire and wire nails is light, buyers placing orders mostly for small lots to meet current needs. We quote wire nails at \$3.20, base, per 100-lb. keg in carload lots, and on small lots, \$3.30, base, per keg, c.i.f. Seattle.

Warehouse Business.—Local jobbers report that January was a better month than December, and further betterment in sales is expected this month. A new price card just issued by a local jobber carries an advance of 10 per cent on all sizes of carriage and machine bolts, prices being otherwise unchanged.

Cincinnati

Steel Specifications Good but Prices Weaken—Pig Iron Sluggish

CINCINNATI, Feb. 8.—The pig iron market in the past week has been sluggish, sales having been limited principally to small scattered lots and inquiries of consequence having been scarce. Consumers apparently have enough iron to fulfill their requirements during the remainder of the first quarter, and little interest has been aroused in purchasing tonnage for delivery beyond April 1. The satisfactory way in which melters

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes....	3.40c.
Bars, mild steel or iron.....	3.30c.
Reinforcing bars.....	3.30c.
Hoops.....	4.00c. to 4.25c.
Bands.....	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares.....	4.35c.
Open-hearth spring steel.....	4.75c. to 5.00c.
No. 24 black sheets.....	4.05c.
No. 10 blue annealed sheets.....	3.60c.
No. 24 galvanized sheets.....	4.90c.
Structural rivets.....	3.75c.
Small rivets.....	.65 per cent off list
No. 9 annealed wire, per 100 lb.....	\$3.00
Common wire nails, base per keg.....	2.95
Cement coated nails, base per 100-lb. keg..	3.15
Chain, per 100 lb.....	7.55
	Net per 100 Ft.
Lap welded steel boiler tubes, 2-in.....	\$18.00
4-in.....	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.....	39.00

are specifying against current contracts lends a note of encouragement to the situation. Lake Erie furnaces still dominate the southern Ohio market from a price standpoint. Quotations of \$18, base Cleveland, and under, have been made to secure business, and a Toledo producer is reported to be accepting orders at \$18.25, base furnace. Meanwhile sellers in the Ironton district are pursuing a waiting policy in the hope that northern Ohio competitors either will book sufficient tonnage to withdraw as active participants in the market or will stiffen their schedules. As a result, southern Ohio foundry iron remains at \$20, base furnace, but melters are refusing to place orders on that basis. Southern iron ranges from \$18 to \$19, base Birmingham, and furnace interests will not quote on second quarter inquiries. Jackson County silvery producers are asking \$28.50, furnace, for 8 per cent, but bookings in the past two weeks have been small. The Anderson Stove Co., Anderson, Ind., has purchased 700 to 1000 tons of foundry iron, and the Ross-Meehan Foundries, Chattanooga, Tenn., have bought 500 tons of malleable.

Based on freight rates of \$3.69 from Birmingham and \$1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25	
(base).....	\$21.69
Alabama fdy., sil. 2.25 to 2.75...	22.19
Tennessee fdy., sil. 1.75 to 2.25...	21.69
Southern Ohio silvery, 8 per cent	30.39
So. Ohio fdy., sil. 1.75 to 2.25....	21.89
So. Ohio malleable.....	\$20.64 to 21.89

Finished Material.—While specifications and orders have been in fairly good volume, severe competition among producers has forced prices to lower levels. Bars and structural shapes have dropped \$2 a ton to 1.90c., base Pittsburgh, these two products now being on the same basis as structural plates. The Louisville & Nashville Railroad is reported to have placed about 400 tons of plates with the Tennessee Coal, Iron & Railroad Co. The naming of low delivered prices by independent mills at consuming points along the Ohio River has added further confusion to the situation in the sheet market. The mills justify their policy of granting concessions on the ground that the shipment of material by barge down the river makes it possible to effect a considerable saving, which is being passed along to the consumer. Galvanized sheets range from 3.65c. to 3.75c., base Pittsburgh, and black sheets are bringing from 2.80c. to 2.90c., base Pittsburgh. Sales of blue annealed sheets have been made at 2.20c. to 2.25c., base Pittsburgh. A reduction of 5c. a keg on common wire nails has established the market at \$2.60 per keg, base Ironton or Pittsburgh, but plain wire remains unchanged at \$2.50 per 100 lb., base Ironton or Pittsburgh. Cold-rolled steel is in fair demand, and companies allied with the automotive industry are taking slightly larger tonnages. Little structural work has come out lately, and fabricators in this territory are in need of new jobs to keep production on the present schedules.

Reinforcing Bars.—There has been no improvement in business during the past week, but mills expect a considerable number of jobs to come up for bids in the next month. Meanwhile, new billet bars nominally stand at 2c., base Pittsburgh, and rail steel bars at 1.90c., base mill.

Warehouse Business.—Several important jobbers report increased sales in the past week, the betterment being reflected particularly in structural steel. The recent decline in the mill prices of sheets and of nails has not affected quotations on these products for shipment from local warehouses.

Coke.—Signs of a slight stiffening in prices and of the desire of some consumers to stock material in anticipation of a coal strike April 1, are noted. Specifications for both Wise County and New River beehive foundry coke have increased, and two producers in the latter field are unwilling to take business under \$7.50 per net ton, f.o.b. ovens. A nearby steel company has purchased a small tonnage of beehive furnace coke from the Wise County district at less than \$4, ovens, but despite this particular case, in which concessions were made, furnace grades are commanding better prices than a week ago. A melter in this territory has contracted for 2000 tons of foundry coke for delivery during February and March, while a Michigan auto-

mobile manufacturer has renewed a sizable contract for New River foundry coke. Specifications and orders for by-product foundry coke are heavier.

Based on freight rates of \$2.14 from Ashland, Ky., and \$2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Wise County foundry, \$7.59 to \$8.09; New River foundry, \$10.09 to \$10.59; by-product foundry, \$9.64 to \$10.14.

Old Material.—Sales in the past week have been of small volume, but steel mills in this and the Valley districts are accepting material on contract at a fairly good rate. Prices have been well maintained.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel.....	\$12.50 to \$13.00
Scrap rails for melting.....	12.50 to 13.00
Short rails.....	17.50 to 18.00
Relaying rails.....	26.50 to 27.00
Rails for rolling.....	14.00 to 14.50
Old carwheels.....	12.00 to 12.50
No. 1 locomotive tires.....	16.50 to 17.00
Railroad malleable.....	14.50 to 15.00
Agricultural malleable.....	13.50 to 14.00
Loose sheet clippings.....	9.00 to 9.50
Champion bundled sheets.....	9.50 to 10.00
Per Net Ton	
Cast iron borings.....	8.00 to 8.50
Machine shop turnings.....	7.50 to 8.00
No. 1 machinery cast.....	16.00 to 17.00
No. 1 railroad cast.....	13.00 to 13.50
Iron axes.....	19.50 to 20.00
No. 1 railroad wrought.....	9.00 to 9.50
Pipes and flues.....	7.50 to 8.00
No. 1 busheling.....	9.00 to 9.50
Mixed busheling.....	6.00 to 6.50
Burnt cast.....	7.00 to 7.50
Stove plate.....	9.00 to 9.50
Brake shoes.....	9.50 to 10.00

Boston

Pig Iron Sold at \$17, Buffalo—No Iron Imports in January—Scrap Drops

BOSTON, Feb. 8.—Indications are that the peak in this pig iron buying movement has been passed, although the heater makers, among the largest of New England consumers, have yet to cover on second quarter requirements. Sales the past week approximated 10,000 tons, contrasted with about 15,000 tons for each of the two preceding weeks. Buffalo producers and at least one New York State furnace are the most aggressive sellers. One Buffalo maker has taken numerous orders for No. 2X iron for second quarter delivery at \$17.50 a ton, furnace, and has accepted, on offers, \$17 for the same grade of iron. New York State iron, while not meeting \$17 a ton, Buffalo, has been sold on a delivered basis equivalent to less than \$17.75, Buffalo furnace. The largest sale reported was 1000 tons of No. 2X iron to a western Massachusetts foundry, but price details cannot be confirmed. Otherwise, transactions range from 750 tons down to car lots. Certain Buffalo and east-of-Buffalo furnaces are less inclined to disregard silicons than they were a week ago, and western and eastern Pennsylvania, Virginia and Alabama producers are holding to former schedules, which gives the market a spotty appearance.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Soft steel bars and small shapes.....	3.265c.
Flats, hot-rolled.....	4.15c.
Reinforcing bars.....	3.265c. to 3.54c.
Iron bars—	
Refined.....	3.265c.
Best refined.....	4.60c.
Norway, rounds.....	6.60c.
Norway, squares and flats.....	7.10c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees.....	3.365c.
Zees.....	3.465c.
Plates.....	3.365c.
Spring steel—	
Open-hearth.....	5.00c. to 10.00c.
Crucible.....	12.00c.
Tire steel.....	4.50c. to 4.75c.
Bands.....	4.015c. to 5.00c.
Hoop steel.....	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons.....	4.05c.
Squares and flats.....	4.55c.
Toe calk steel.....	6.00c.

We quote delivered prices per gross ton to most New England points as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$6.91 to \$8.77 from Alabama:

East. Penn., sil. 1.75 to 2.25....	\$24.65 to \$25.15
East. Penn., sil. 2.25 to 2.75....	25.15 to 25.65
Buffalo, sil. 1.75 to 2.25.....	21.91 to 22.91
Buffalo, sil. 2.25 to 2.75.....	21.91 to 23.41
Virginia, sil. 1.75 to 2.25.....	27.42
Virginia, sil. 2.25 to 2.75.....	27.92
Alabama, sil. 1.75 to 2.25.....	24.91 to 26.77
Alabama, sil. 2.25 to 2.75.....	25.41 to 27.27

Cast Iron Pipe.—B. Nicoll & Co., offering German material, were again the low bidders on the 3000 tons of pipe readvertised by Boston, and the Warren Foundry & Pipe Co. was again the low American bidder. The spread between the German and the American pipe this time was about \$13,000 on the lot. The city, it is expected, will make an award this week. Malden, Mass., has awarded 200 tons of 6 to 12-in. pipe to the Crane Co. B. Nicoll & Co. were the low bidders on this lot, however. Springfield, Mass., will open bids Feb. 17 on approximately 700 tons of 4, 6 and 8-in. New England specification pipe. Stone & Webster, Inc., has closed on a part of its 1927 gas pipe requirements and will place the remainder this week. Prices on small American pipe appear firmer, although not actually higher. The market for large pipe, however, is still subject to varying discounts. Prices quoted openly on American pipe are: 4-in., \$58.10 a ton, delivered common Boston freight rate points; 6 to 12-in., \$53.10 to \$54.10; larger pipe, \$52.10 to \$53.10. A \$5 differential is asked on Class A and gas pipe.

Coke.—Not much change is noted in the foundry coke situation. New England producers are still billing out fuel at \$13 a ton, delivered, within a \$3.10 freight rate zone, with bookings and specifications running about as heretofore. They are having an excellent domestic coke business on a basis of \$9 a ton, ovens, Everett, Mass. Connellsville 72-hr. foundry coke is still available at a delivered price well under that for New England fuel, but very little is being bought in this territory.

Imports.—During January the Mystic Iron Works, Everett, Mass., received 6986 tons of ore from Naraik and 9066 tons from Sweden, a total of 16,052 tons, which compares with 23,939 tons received in December, 1926. No foreign pig iron was landed in Boston during January. It was the first month in two years that some pig iron was not imported. In December, last, 1071 tons was received here; in January, 1926, 4061 tons was imported, and in January, two years ago, 8212 tons.

Old Material.—With steel mills evincing no greater interest in old material than they did a week ago and with holders of material a little more anxious to sell, the market is weaker. About the best dealers will pay today is \$10.50 a ton on cars for heavy melting steel, \$8 for yard steel, \$7 for machine shop turnings, \$8 for rolling mill borings, \$6.50 for mixed borings and turnings, \$8 for forged scrap and \$10.50 for scrap rails, these prices all representing a decline of 50c. a ton. Offers for railroad malleable also have been lowered 50c. a ton. There is no sizable demand for chemical borings and bundled skeleton, but it is sufficient to hold prices steady. Likewise there is little inclination to shade prices for machinery cast and stove plate.

The following prices are for gross-ton lots, delivered at consuming points:

Textile cast.....	\$18.00 to \$18.50
No. 1 machinery cast.....	17.00 to 17.50
No. 2 machinery cast.....	15.50 to 16.00
Stove plate.....	13.00 to 13.25
Railroad malleable.....	16.50 to 17.00

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$10.00 to \$10.50
No. 1 railroad wrought.....	12.00 to 12.25
No. 1 yard wrought.....	11.00 to 11.25
Wrought pipe (1 in. in diameter, over 2 ft. long).....	8.50 to 9.00
Machine shop turnings.....	6.50 to 7.00
Cast iron borings, chemical.....	10.00 to 10.50
Cast iron borings, rolling mill.....	7.50 to 8.00
Blast furnace borings and turnings.....	6.00 to 6.50
Forged scrap.....	7.50 to 8.00
Bundled skeleton, long.....	2.60 to 3.00
Forged flashings.....	8.00 to 8.50
Shafting.....	15.00 to 15.50
Street car axles.....	15.50 to 16.00
Rails for rerolling.....	11.00 to 11.50
Scrap rails.....	10.00 to 10.50

Buffalo

Pig Iron Bookings Total 40,000 Tons— Mill Operations Show Slight Gain

BUFFALO, Feb. 8.—The buying movement in pig iron continues, with practically all furnaces absorbing sizable tonnages. Lower prices have had the effect of increasing the radius of the Buffalo market, making it easier for local interests to reach into New England and New Jersey. Bookings for this district throughout the week were probably between 30,000 and 40,000 tons. One seller is known to have taken an aggregate of between 12,000 and 15,000 tons, including one for 2000 tons of foundry and another for 1200 tons of malleable. Several 1000-ton lots of foundry were included, though most of the inquiries were for tonnages ranging between 300 and 800. The American Locomotive Co. was among the inquirers, asking for 1500 tons of second quarter foundry, and the New York Air Brake Co. sought 500 tons of foundry for the first quarter and 1000 tons of malleable for the second quarter. One maker reports that approximately two-fifths of its bookings for the week were for first quarter and about three-fifths for second quarter. A considerable tonnage has been booked locally at \$18.75, furnace. The Donner Steel Co. expects to have its No. 1 furnace in blast again by the first of March, which will bring the district total up to 14.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdy., sil. 1.75 to 2.25	\$17.50 to \$18.75
No. 2X foundry, sil. 2.25 to 2.75	18.00 to 19.25
No. 1X foundry, sil. 2.75 to 3.25	18.00 to 20.25
Malleable, sil. up to 2.25	17.50 to 18.75
Basic	17.50 to 19.00
Lake Superior charcoal	27.25

Old Material.—The general condition of the market has improved, but there has been no new buying by the mills. A mill that consumes considerable heavy melting steel of selected quality is still holding up shipments, though these may be resumed this week. Another large mill is continuing to subject its receipts to searching inspection, with many rejections resulting. Dealers are buying stove plate and some No. 1 machinery cast, along with turnings and borings for blast furnace use. Railroad lists have not yet been completely closed at this writing. Low pig iron prices are inclined to hold the market back, but a strengthening movement in outside markets is helping to counterbalance this.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$15.00 to \$15.25
Selected No. 1 heavy melting steel	16.25 to 16.75
Low phosphorus	17.50 to 18.00
No. 1 railroad wrought	13.00 to 13.50
Carwheels	16.00 to 16.50
Machine shop turnings	9.00 to 9.50
Mixed borings and turnings	12.00 to 12.50
Cast iron borings	13.00 to 13.50
No. 1 busheling	15.00 to 15.50
Stove plate	14.50 to 14.75
Grate bars	12.00 to 13.00
Hand bundled sheets	10.50 to 11.50
Hydraulic compressed sheets	15.00 to 15.50
No. 1 machinery cast	16.00 to 16.25
Railroad malleable	16.50 to 17.00
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50
Drop forge flashings	13.00 to 13.50

Finished Iron and Steel.—The market is steadily improving, conditions being better than they were two weeks ago. Operations are slightly improved; inquiries and specifications are better. Prices on bars are not quite so strong, 2.165c, Buffalo, being generally quoted, though there is some 2.265c. material moving. The general price structure is inclined to be weak, though mills are confident that if they can get a back-

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Mild steel bars	3.30c.
Cold-finished shapes	4.45c.
Rounds	3.95c.
No. 24 black sheets	4.30c.
No. 10 blue annealed sheets	3.80c.
No. 24 galvanized sheets	5.15c.
Common wire nails, base per keg	\$3.90
Black wire, base per 100 lb.	3.90

log this condition will remedy itself. Bolt and nut business is fairly good, and the pipe situation is fair, though this is normally a slow month for butt welded pipe. The sheet market is weaker, better than 2.90c., Pittsburgh, for No. 24 gage black having been done. There have been no fabricated structural steel contracts of size placed and no large reinforcing bar jobs.

Detroit Scrap Quiet as Automobile Production Gains

DETROIT, Feb. 8.—Shipments of pig iron in the district show an increase over January, this being direct evidence of a gain in automobile production. There has been no activity in the old material market, with the result that there has been no change in prices during the past week.

Heavy melting and shoveling steel	\$13.00 to \$13.50
Borings and short turnings	9.00 to 9.50
Long turnings	7.75 to 8.25
No. 1 machinery cast	17.00 to 18.00
Automobile cast	18.00 to 19.00
Hydraulic compressed	11.50 to 12.00
Stove plate	13.50 to 14.50
No. 1 busheling	11.00 to 11.50
Sheet clippings	8.25 to 8.75
Flashings	11.25 to 11.75

Valley Steel Output Gains—Sheet Merger Negotiations Progressing

YOUNGSTOWN, Feb. 8.—Production moved close to an 80 per cent average this week in the Mahoning Valley in both steel-making and rolling mill divisions. Steel production is mounting because of larger requirements of finishing mills and the possibility of interference with production by a coal strike in the spring. Of 53 independent open-hearth furnaces, 42 are melting, and 122 of 127 sheet mills are running.

The Youngstown Sheet & Tube Co. has blown out a blast furnace in its Iroquois group at South Chicago.

Conferences the past week have brought the merger of Central Western independent sheet mills nearer a conclusion. Seven companies with an annual productive capacity of 450,000 tons of black sheets as a base product are included in the proposed line-up, subject to changes.

W. H. Davey of the Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, is scheduled to head the consolidation. Stockholders of the Mahoning Valley Steel Co., Niles, at a special meeting Monday, decided against inclusion in the combination on the basis of proposals to date, but expressed a willingness to sell at the right terms.

One-Third of Lake Superior Ores Beneficiated

Over one-third of the iron ore shipped from the Lake Superior district in 1926, or 21,525,067 tons, was given some form of beneficiation, according to data collected by the Lake Superior Iron Ore Association. This was a considerable gain over the amount beneficiated during the previous year. There was a marked increase in the quantity of ore that was crushed and screened, due to the increase of plants for these processes. The amount that was washed decreased somewhat during the year, owing to the termination of leases of some properties having washing plants.

The amounts of ore prepared under various processes were: Washed, 5,297,498 tons; dried 157,336 tons; jigged, 100,499 tons; sintered, nodulized and briquetted, 138,061 tons; crushed and screened, 15,831,673 tons.

The annual sales convention of the Independent Pneumatic Tool Co. was held during the week of Jan. 17. For the first four days all of the sessions were at the factory at Aurora, Ill., with the annual banquet on Wednesday night. The convention then adjourned to Chicago and the last two days were spent at the general offices of the company.

FABRICATED STRUCTURAL STEEL

Week's Awards About 25,000 Tons—Business Pending Amounts to 43,000 Tons

Miscellaneous awards in New York amounting to 11,000 tons and a railroad bridge in New Jersey of 4000 tons, together with a number of smaller jobs, make a total of about 25,000 tons of structural steel lettings within the past week. Included in 43,000 tons of work on which bids are being taken is a department store in Newark, N. J., calling for about 15,000 tons, and a bridge in the State of Washington taking 10,000 tons. Awards follow:

NEW YORK, 11,000 tons in the following awards as reported to the Structural Steel Board of Trade, Inc.: 24-story loft building, Broadway and Thirty-seventh Street, and ice plant, 234th Street and Bewley Avenue, to A. E. Norton, Inc.; 15-story physicians' building, 31-33 Lincoln Place, Newark, and 15-story apartment building, 442-448 East Fifty-seventh Street, to Hay Foundry & Iron Works; theater, Port Washington, L. I., shed, 542-544 East 117th Street, alteration job, 154-156 Seventh Avenue, and club house, Fiftieth Street and Fourteenth Avenue, Brooklyn, to George A. Just Co.; 11-story apartment building, 718 Lexington Avenue, nine-story apartment building, 334 West Eighty-seventh Street, 15-story apartment building, 143 West Ninety-sixth Street, and 15-story apartment building, 710 West End Avenue, to Paterson Bridge Co.; creamery, Sheffield Farms, Jamaica, L. I., theater, Kew Gardens, L. I., and professional building, Hanson Place, Brooklyn, to Levering & Garrigues Co.

NEW YORK, 250 tons, theater, 31 Canal Street, to Hinkle Steel Construction Co.

NEW YORK, 1200 tons, loft building on West Fifty-seventh Street, to Harris Structural Steel Co.

BROOKLYN, 200 tons, turkish bath building, Coney Island Avenue and Avenue J, to Joseph Gaydica Iron Works.

BROOKLYN, 250 tons, motion picture theater, Buffalo Avenue, to National Bridge Works.

NEWARK, N. J., 15,000 tons, building for L. Bamberger & Co., department store.

JERSEY CITY, 200 tons, Pier 9, Erie Railroad, to American Bridge Co.

PRINCETON, N. J., 250 tons, graduate building and dormitory, Princeton University, to N. A. K. Bugbee, 206 Hanover Street, Trenton, N. J.

DELAWARE, LACKAWANNA & WESTERN RAILROAD, 4000 tons, bridge over Hackensack River in New Jersey, to American Bridge Co.

HAY'S CROSSING, PA., 200 tons, bridge for Pennsylvania Railroad, to Bethlehem Steel Co.

GREENSBORO, N. C., 400 tons, plate girder work, to Carolina Steel & Iron Co.

CONNELLSVILLE, PA., 160 tons, Connellsville State Hospital building, to Bollinger-Andrews Construction Co., Pittsburgh.

PITTSBURGH, 770 tons, five barges for Iron City Sand & Gravel Co., to Jones & Laughlin Steel Corporation.

YOUNGSTOWN, 100 tons, United Engineering & Foundry Co. machine shop addition, to Guilbert Steel Co.

FORT WAYNE, IND., 600 tons, theater, to Rochester Bridge Co., Rochester, Ind.

AURORA, ILL., 115 tons, boiler frames for Western United Gas & Electric Co., to an unnamed bidder.

CEDAR RAPIDS, IOWA, 125 tons, Shriners' temple, to Des Moines Steel Co.

KELLOGG, IDAHO, 1000 tons, plant for Sullivan Mining Co., to Minneapolis Steel & Machinery Co.

SAN CARLOS, ARIZ., 700 tons, for the Coolidge dam, to an unnamed firm through Atkinson & Spicer, Los Angeles.

OAKLAND, CAL., 1000 tons, apartment building, Euclid and Grand Avenues, to Judson Mfg. Co., San Francisco.

OAKLAND, 500 tons, office building, Seventeenth and Franklin Streets, to Judson Mfg. Co.

STOCKTON, CAL., 100 tons, department store addition for the Stockton Dry Goods Co., to an unnamed fabricator.

LONG BEACH, CAL., 1000 tons, power plant for the Southern California Edison Co., to Llewellyn Iron Works, Los Angeles.

SAN FRANCISCO, 250 tons, Lacy Apartments, Geary and Leavenworth Streets, to Herrick Iron Works, Oakland.

SAN FRANCISCO, 100 tons, theater, Twenty-ninth and Caraval Streets, to Golden Gate Iron Works.

PORTLAND, ORE., 150 tons, three small bridges, to an unnamed fabricator.

HONOLULU, 150 tons, building for the Y. M. C. A., to an unnamed fabricator.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BEDFORD, MASS., 100 tons, Veterans' Hospital.

BOSTON, 100 tons, candy factory power house addition.

DEVON, CONN., 400 tons, substation for Connecticut Light & Power Co.

PENNSYLVANIA RAILROAD, 600 tons, bridges for electrification of Philadelphia-Wilmington line.

JERSEY CITY, N. J., 300 tons, addition to refinery of Standard Oil Co. of New Jersey.

NEW YORK, 5000 tons, De Witt Clinton High School in the Bronx.

NEW YORK, 1500 tons, loft building at 264 West Fortieth Street.

SANDUSKY, OHIO, 260 tons, school, to Rochester Bridge Co.

MIAMI, FLA., 1000 tons, causeway.

NEW ORLEANS, 650 tons, hotel.

CHICAGO, 5000 tons, Daily News Building.

CHICAGO, 650 tons, Northwest Lions' Club.

ROCK ISLAND, ILL., 500 tons, bridges.

MINNEAPOLIS, 2000 tons, pipe line.

RACINE, WIS., 500 tons, Strauss double leaf bascule bridge over Root River; bids close March 2.

CRODT, ARK., 625 tons, bridge.

STATE OF WASHINGTON, 10,000 tons, bridge over Columbia River.

HOQUIAM, WASH., 582 tons, bridge on State Road No. 9 over the Hoquiam River; bids Feb. 15 at office of State Highway Commission, Olympia.

GREY'S HARBOR, WASH., 650 tons, highway bridge.

CHELAN, WASH., 200 tons, power house.

PORTLAND, ORE., 1800 tons, apartment hotel.

OAKLAND, CAL., 250 tons, Lowell School, California Steel Co., San Francisco, low bidder.

NAPA, CAL., 155 tons, hotel.

SAN DIEGO, CAL., 5250 tons, toll bridge between San Diego and Coronado, Cal.; bids to be called soon.

SAN FRANCISCO, 300 tons, addition to Hotel Whitcomb; bids being taken.

HONOLULU, tonnage unstated, Honolulu Stadium; bids to be called soon.

RAILROAD EQUIPMENT

Orders for Freight Cars Total 2250 and 625 Additional Are Inquired For

The Canadian National and the Burlington roads have each ordered 1000 freight cars and two smaller orders from other roads bring the total of the week's orders to 2250 cars. New inquiries are for 625 cars. There is also good inquiry for car parts for repairs. Details follow:

The Canadian National Railways have ordered 1000 automobile box cars and 2 baggage-mail cars from the Pressed Steel Car Co. and 20 sleeping cars, 12 dining cars and 5 observation cars from the Canadian Car & Foundry Co.

The Chicago, Burlington & Quincy has ordered 500 box cars from the Pressed Steel Car Co. and the same number from the Pullman Car & Mfg. Corporation. This road is also inquiring for 11 gasoline-electric motor cars.

The Chicago & North Western has ordered 500 sets of steel underframes and superstructures for cars from the Illinois Car & Mfg. Co. and is inquiring for 1335 additional sets for box cars and for 25 steel underframe caboose cars. This road will also purchase 12 2-8-4 type locomotives.

The Atchafalpa, Topeka & Santa Fe has ordered 150 sulphur cars from the American Car & Foundry Co. and is inquiring for 50 air-dump cars of the Enterprise type and 50 ballast cars.

The Chesapeake & Ohio is in the market for 500 gondola car bodies.

The Bangor & Aroostook is inquiring for 100 steel underframes and superstructures for cars.

The Union Railroad has invited bids on the repair of 500 to 1200 70-ton hopper cars.

The Great Northern is inquiring for 500 box cars, 14 tank cars and 12 locomotive tenders.

The Boston & Maine Railroad is preparing specifications for 25 heavy-duty steam locomotives, bids for which will be asked shortly. It has placed an order with Friedrich Krupp A. G., Essen, Germany, for a Diesel direct-drive locomotive, interchangeable in freight, passenger and switching service.

The Mobile & Ohio has placed 50 gondola and 50 hopper cars with the Tennessee Coal, Iron & Railroad Co.

The St. Paul has ordered 5 passenger-baggage motor car bodies from the Standard Steel Car Co.

* The Southern Pacific is in the market for 10 locomotives.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound
for
Early Delivery

	Feb. 8	Feb. 7	Feb. 5	Feb. 4	Feb. 3	Feb. 2
Lake copper, New York....	12.75	12.75	12.75	12.87½	13.00	13.12½
Electrolytic copper, N. Y.*	12.30	12.35	12.50	12.50	12.60	12.75
Straits tin, spot, New York..	69.50	68.75	---	67.50	67.00	67.00
Lead, New York.....	7.40	7.40	7.40	7.40	7.40	7.40
Lead, St. Louis.....	7.22½	7.22½	7.22½	7.22½	7.22½	7.22½
Zinc, New York.....	6.90	6.95	6.92½	6.90	6.92½	6.92½
Zinc, St. Louis.....	6.55	6.60	6.57½	6.55	6.57½	6.57½

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Feb. 8.—All the markets are quiet and most of them are weak. Tin has been advancing on a fair amount of buying. Copper has declined to new low levels and zinc has just about held its own. Prices of lead have not changed in a moderately active market.

Copper.—A decline of about ½c. per lb. in electrolytic copper is the feature of the week. Production in excess of consumption is still the weak point in the situation. There are also one or two producers willing to make concessions. In spite of this, domestic consumers are not actively buying, but are closely watching the market. Electrolytic copper is quoted today at 12.50c. to 12.60c., delivered in the Connecticut Valley, though some producers still insist that 12.60c. to 12.62½c. is still the market. There are indications that several consumers will be active buyers as soon as the market definitely settles at what appears to be the minimum. There have also been severe cuts in the export market. Yesterday, Monday, Copper Exporters, Inc., reduced its quotation to 13c., c.i.f., Hamburg, effective today, Tuesday. There has been very little buying by foreign countries. Lake copper is quoted at 12.75c., delivered, also a decline of ½c. for the week.

Tin.—The week has been a much quieter one. Sales were about 1200 tons compared with 3000 the week before. Consumers have not been very active, most of the buying being confined to dealers. On Saturday 200 tons changed hands with some dealers anxious buyers. Yesterday, Monday, the market was very dull with about 100 tons representing the total turnover,

while today it was strong and fairly active with spot Straits tin quoted nominal at 69.50c., New York. Prices in London today were considerably higher than a week ago, with spot standard quoted at £305, future standard at £295 10s. and spot Straits at £313 10s. The Singapore market today was £304. It is pointed out that the premium on spot Straits tin at New York over May delivery has increased sharply. On Friday, Feb. 4, this premium was 2.62½c., whereas 10 days earlier it was 1.12½c. per lb. Arrivals thus far this month have been 950 tons with 5310 tons afloat.

Lead.—Demand is moderately good and the market is steady. The leading interest continues to quote 7.40c., New York, as its contract price. In the outside market prices are a little firmer at 7.22½c. to 7.25c., St. Louis.

Zinc.—Conditions have changed but little either as to activity or prices. Demand from consumers is light, dealers are not active and producers are not forcing the market. Ore is still selling at \$42 per ton with supplies curtailed and mining output lessened. The present price contrasts with \$58 late in 1925 and \$50 early last year. Prime Western zinc is quoted today at 6.65c. to 6.60c., St. Louis, or 6.90c. to 6.95c., New York.

Antimony.—Conditions in China still favor higher prices and Chinese metal is quoted today for spot delivery at 15.25c., New York, with futures at 15c.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 26c. per lb., delivered.

List Prices Per Lb., f.o.b. Mill

FEB. 8.—The demand for tin has increased and the price has advanced. Consumers' orders for copper are

Metals from New York Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	70.00c. to 71.00c.
Tin, bar	72.00c. to 73.00c.
Copper, Lake	14.37½c.
Copper, electrolytic	14.12½c.
Copper, casting	13.62½c.
Zinc, slab	7.25c. to 7.75c.
Lead, American pig.....	8.25c. to 8.75c.
Lead, bar	10.75c. to 11.25c.
Antimony, Asiatic	16.50c. to 17.00c.
Aluminum, No. 1 ingot for remelting (guaranteed over 99 per cent pure) ..	29.00c. to 30.00c.
Babbitt metal, commercial grade ..	30.00c. to 40.00c.
Solder, ½ and ¼	43.00c. to 44.00c.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	72.50c.
Tin, bar	74.50c.
Copper, Lake	14.25c.
Copper, electrolytic	14.25c.
Copper, casting	13.25c.
Zinc, slab	8.25c.
Lead, American pig.....	8.25c.
Antimony, Asiatic	19.50c.
Lead, bar	10.00c.
Babbitt metal, medium grade.....	20.75c.
Babbitt metal, high grade.....	74.50c.
Solder, ½ and ¼	42.25c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

Sheets—	
High brass	18.12½c. to 19.12½c.
Copper, hot rolled.....	21.75c. to 22.75c.
Copper, cold rolled, 14 oz. and heavier ..	24.00c. to 25.00c.
Seamless Tubes—	
Brass	23.00c. to 24.00c.
Copper	23.75c. to 24.75c.
Brazed Brass Tubes.....	26.62½c. to 27.62½c.
Brass Rods	15.87½c. to 16.87½c.

From New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks.....	12.75c. to 13.00c.
Zinc sheets, open.....	13.25c. to 13.50c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products were reduced ¼c. on Feb. 7. Zinc sheets and lead full sheets are still being quoted at the reductions of Jan. 10 and 24, respectively.

Non-Ferrous Metals at Chicago

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	17.87½c.
Copper, hot rolled.....	21.50c.
Zinc	11.00c.
Lead (full sheets).....	11.00c. to 11.25c.

Seamless Tubes—	
High brass	22.75c.
Copper	23.50c.

Rods—	
High brass	15.62½c.
Naval brass	18.37½c.

Wire—	
Copper	14.87½c.
High brass	18.37½c.
Copper in Rolls.....	20.37½c.
Brazed Brass Tubing.....	25.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide.....	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse (Prices Cover Trucking to Customers' Doors in City Limits)	
Base per Lb.	
Sheets—	
High brass	17½c.
Copper, hot rolled.....	21.25c.
Copper, cold rolled, 14 oz. and heavier.....	23.50c.
Zinc	12.00c.
Lead, wide	10.25c.
Seamless Tubes—	
Brass	22.50c.
Copper	23.25c.
Brazed Brass Tubes.....	25½c.
Brass Rods	15½c.

light and the foreign market is dull. Prices of old metals are easier.

We quote in carload lots: Lake copper, 13c.; tin, 69c.; lead, 7.30c.; zinc, 6.65c.; in less than carload lots, antimony, 16.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.25c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 7.25c.; lead pipe, 6.25c.; zinc, 4.25c.; pewter, No. 1, 35c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 15c.; all being dealers' prices for less than carload lots.

REINFORCING STEEL

Awards of 6700 Tons Include 2250 Tons for a Dam in Arizona—3100 Tons Pending

Concrete reinforcing steel awards for the week totaled about 6700 tons, of which 2250 tons will go into a dam in Arizona. A number of small jobs pending make a total of about 3100 tons. Awards follow:

- STAMFORD CONN., 350 tons, high school, to Truscon Steel Co.
YONKERS, N. Y., 120 tons, elimination of grade crossings, to Joseph T. Ryerson & Son, Inc.
GLENDALE, L. I., 215 tons, factory building for P. L. Andrews Corporation, to McClintic-Marshall Co.
CHICAGO, 260 tons, garage at 1100 Clark Street, to Barton Spider Web System.
CHICAGO, 100 tons of rail steel, Midway Drexel apartment building, to Inland Steel Co.
CHICAGO, 100 tons of rail steel, State road work, to Truscon Steel Co.
MILWAUKEE, 120 tons, Garfield Theater, to Concrete Engineering Co.
MADISON, WIS., 110 tons, Post Office, to Concrete Engineering Co.
CHICAGO, 110 tons of rail steel, State road work, to Kalman Steel Co.
SAN CARLOS, ARIZ., 2250 tons, for the Coolidge dam near San Carlos, to an unnamed firm through Atkinson & Spicer, Los Angeles.
ORLANDO, CAL., 750 tons, for Stoney Gorge dam, to unnamed firm through Ambursen Construction Co., San Francisco.
SAN DIEGO, CAL., 565 tons, for Sutherland dam near San Diego, to unnamed firm through Edwards, Wilbey & Dickson, Los Angeles.
SACRAMENTO, CAL., 154 tons, building for Blake, Moffett & Towne, to an unnamed San Francisco jobber.
SAN FRANCISCO, 700 tons, two piers on the water front for the State Board of Harbor Commissioners, to an unnamed Eastern mill.
SAN FRANCISCO, 200 tons, garage and dance hall, Van Ness and Market Streets, to an unnamed local jobber.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

- BEDFORD, MASS., 300 tons, Veteran's Hospital.
POUGHKEEPSIE, N. Y., tonnage being estimated, floor slabs for Hudson River Bridge.
PITTSBURGH, 80 tons, north approach to Liberty Bridge.
YOUNGSTOWN, 500 to 600 tons, Erie Railroad warehouse.
CHICAGO, 350 tons, Goodwin Mfg. Co.; L. E. Ritter, architect.
CHICAGO, tonnage being estimated, Northwest Lions Club; Shattuck & Fayer, architects.
CHICAGO, 125 tons, Royal Blue Hotel; Paul Gerhardt, architect.
CHICAGO, 225 tons, hotel at 6320 Dorchester Avenue; A. L. Salzman, architect.

Old Metals, Per Pound, New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible.....	10.50c.	12.25c.
Copper, heavy and wire.....	10.50c.	11.50c.
Copper, light and bottoms...	8.75c.	10.25c.
Brass, heavy	6.50c.	8.00c.
Brass, light	5.75c.	7.25c.
Heavy machine composition.	8.25c.	9.75c.
No. 1 yellow brass turnings.	7.75c.	8.25c.
No. 1 red brass or composition turnings	7.75c.	8.75c.
Lead, heavy	6.25c.	6.75c.
Lead, tea	4.25c.	5.00c.
Zinc	3.75c.	4.25c.
Sheet aluminum	15.00c.	17.00c.
Cast aluminum	15.00c.	17.00c.

- CHICAGO, 550 tons, garage at 715 Mather Street; E. R. Ruppert, architect.
CHICAGO, 125 tons, apartment building at 5346 Cornell Avenue; M. L. Bein, architect.
CHICAGO, 250 tons, apartment building at 6929 Crandon Avenue; R. S. DeGolyer, architect.
SANTA ANA, CAL., 153 tons, two bridges at Santa Ana over the San Juan Creek; bids Feb. 8.
SAN DIEGO, CAL., 100 tons, paving job for San Diego County; bids Feb. 28.
SAN DIEGO, CAL., 137 tons, toll bridge; bids to be called soon.
HOQUIAM, WASH., 125 tons, bridge for the State Highway Commission over the Hoquiam River; bids Feb. 15 at Olympia.
WAUKEGAN, ILL., 500 tons, filtration plant, to Concrete Engineering Co.
SPRINGFIELD, ILL., 125 tons of rail steel, for State road work, to Concrete Engineering Co.

TARIFF ON PIG IRON

Commission Reported to Have Recommended Advance of 50 Per Cent in Duty

WASHINGTON, Feb. 8.—The United States Tariff Commission late last week sent to President Coolidge its report and recommendation regarding the application of Eastern merchant blast furnace interests for an increase of 50 per cent in the present duty of 75c. per gross ton on pig iron. While it is reported that the commission has recommended that the President promulgate an order granting the application, thus bringing the duty to \$1.125 per ton, the rumor cannot be verified. Nor has it been indicated when the President may act upon the recommendation. Generally he takes action soon after such recommendations are received by him and for the most part they are approved, though there are notable exceptions.

The point has been made that the pig iron case has been pending for so long that conditions existing when it was instituted have greatly changed, and that therefore the producers have lost interest in it and would not derive much benefit from an increase of 37.5c. per ton. At the time the case was started the Eastern merchant producers were particularly concerned over incoming shipments of pig iron from India. Imports from that country now are small. Germany at present is the source of the greatest imports of pig iron, but even these imports have dwindled and it is said the German pig iron prices are virtually the same as domestic prices.

However, there are those who claim that, if the increase in the pig iron duty were granted, it would prove a good precedent for going to Congress with the plea for higher duty. The Eastern furnace interests sought the increase under the flexible provisions of the Fordney-McCumber tariff act, which provides that the maximum increase cannot exceed 50 per cent over the existing duty.

It was announced today at the White House that the President has taken the matter up for consideration with the Secretary of Commerce and the Secretary of the Treasury.

PERSONAL

Lawrence Wood, assistant general sales manager Colonial Steel Co., Pittsburgh, since April 1, 1926, has been appointed general manager of sales. He entered the employ of the company as a clerk in the sales department late in 1912 and has been with it continuously since that time, with the exception of the period between December, 1917, and January, 1919, which he spent in the Ordnance Corps, U. S. Army, and from which he was discharged with the rank of lieutenant. He served as Pittsburgh district manager of sales and was Detroit district manager for more than two years before his transfer to Pittsburgh to become assistant general sales manager. He was graduated from Amherst College, Amherst, Mass., in 1911.



LAWRENCE WOOD

Francis R. Harris, whose election to the presidency of the newly formed National-Harris Wire Co., 605 North Third Street, Newark, N. J., was announced in THE IRON AGE last week was one of the founders and the first vice-president of the Driver-Harris Co., Harrison, N. J. He retired from the metal and wire business in 1914, but later organized Harris Alloys, Inc., which, together with the National Alloyed Metals Co., Providence, R. I., and the Murray-Harris Wire Co., Newark, was recently consolidated to form the National-Harris Wire Co.

Walter E. Rahm has become a member of the sales engineering staff of the Watson-Stillman Co., 75 West Street, New York, but is not sales manager as reported in a previous issue.

G. L. Wilson has retired from Henry Prentiss & Co., 149 Broadway, New York, after 45 years with that machine tool selling agency. He will spend a few months at Pinehurst, N. C., where for many years he has had a winter residence, following which he may devote some time to travel. Mr. Wilson started with the old firm of H. Prentiss & Co. at the age of 14, when the firm had offices at 42 Dey Street and carried a miscellaneous line of machine shop equipment and supplies. Later he became a salesman and for years covered Long Island. For the past 12 years he has been a director of the corporation.

Joseph J. Haesler, for the last 12 years associated with Charles Hardy, Inc., 1 Pershing Square, New York, dealer in metals and minerals, and Carl Eisen, formerly president of the Eisen Trading Corporation, 233 Broadway, New York, have formed the Metal & Ore Corporation and will engage in an international business in ferrous and non-ferrous metals and ores. Mr. Eisen is president of the new corporation and Mr. Haesler is vice-president and treasurer. Its offices will be located in the Woolworth Building, New York.

Charles B. Rose, until recently vice-president and general manager of the Fageol Motors Co., Kent, Ohio, has been elected executive vice-president of the American La France Fire Engine Co., Inc., Elmira, N. Y. He was formerly vice-president of the Velie Motor Corporation and the Moline Plow Co., both of Moline, Ill.

S. G. Morris, formerly assistant purchasing agent for the Bourne-Fuller Co., Cleveland, has become associated with the Cleveland Duplex Machinery Co., Cleveland, and will represent the company in northeastern Ohio as sales engineer.

John P. Tierney, associated for the last 20 years with Hill, Clark & Co., Inc., Boston, has resigned his position to become president and manager of the General Machinery Corporation, 170 Summer Street, Boston, manufacturers' agent and consulting engineer in electrical and mechanical problems.

Leo F. Caproni, identified for some years in structural steel work with the Bethlehem Steel Co., the Hay Foundry & Iron Works, New York, and more recently with the Palmer Steel Co., Springfield, Mass., has entered business on his own account as manufacturers' representative, with offices at 1056 Chapel Street, New Haven, Conn. He will specialize in structural steel, steel bar joists, gypsum floors and roofs, portable metal buildings, steel sash, metal partitions and other building products, and will also design industrial plants.

William B. Simpson has been elected president of A. M. Castle & Co., Chicago, iron and steel merchants. Other officers elected were Alfred C. Castle and George R. Boyce, vice-presidents; Fred C. Conners, secretary, and Almir C. Cox, treasurer.

George C. Foulkes was elected president of the American Steel Corporation of Indiana, Inc., Terre Haute, Ind., at the first annual meeting of the company. Other officers named for the coming year are Dr. Joseph W. Ricker, first vice-president; Frank J. Wolfe, second vice-president; L. E. Waterman, treasurer, and E. D. Halsey, secretary.

James Criswell, formerly vice-president, and for 38 years general superintendent of construction S. R. Smythe Co., steel plant engineer and contractor, Pittsburgh has resigned.

Taylor Allderdice, president National Tube Co., is again a member of the Pittsburgh Board of Public Education, having been elected by the judges of Allegheny County to fill the unexpired term of C. L. Wooldrige, who resigned recently. Mr. Allderdice was one of the original members of the board as now constituted, serving from 1911 until April, 1920, when the pressure of other duties compelled him to resign. He was vice-president of the board at the time of his resignation and chairman of the property and supplies committee. The high school named for him as a mark of appreciation for services in connection with the schools of Pittsburgh, has been completed and was dedicated this week.

C. A. Grainger, sales manager American Hammered Piston Ring Co., Baltimore, who has been seriously ill for the last several weeks, has returned to his work.

John A. Nelson, for the last eight years chief metallurgist for the Barber-Colman Co., Rockford, Ill., has been appointed chief metallurgist for the Braeburn Alloy Steel Corporation, Braeburn, Pa.

W. H. S. Bateman has been appointed Southeastern district sales manager for the Detroit Seamless Steel Tubes Co., Detroit, with headquarters at 823 Commercial Trust Building, Philadelphia.

Thomas Simons has been made Southern sales manager for the United States Cast Iron Pipe & Foundry Co., with headquarters at Birmingham, succeeding C. H. Gray, retired. Mr. Simons has been in the Kansas City sales department of the company.

Harry Howe, for 21 years special engineer for the Pressed Steel Car Co., New York, has been appointed engineer of railroad equipment for the Manganese Steel Forge Co., Philadelphia, and will be particularly concerned with the development of Rol-Man steel in steam and electric railroad equipment.

E. Cooper Wills, for several years construction engineer at the hot rolling mills of the Driver-Harris Co., Harrison, N. J., has been appointed manager of the Northern Steel Co., 44 School Street, Boston, and will have his headquarters at the company's Gibson Street plant, Medford, Mass.

Charles N. Fitts, New England Structural Co., Boston, has been made chairman of the board of governors of the recently organized Structural Board of Trade of New England, and Ralph Riddle, McClintic-Marshall Co., Boston, is secretary and treasurer.

Lawrence W. Wallace, Washington, executive secretary of the American Engineering Council, has been re-elected president of the Eye Sight Conservation Council of America for 1927. He was also chosen a member of the board of directors for a three-year term.

James E. McKelvey, treasurer of the Erie Foundry Co., Rochester, N. Y., has taken over the management of the Rochester Industrial Development Corporation, a newly organized finance company which will cooperate with the chamber of commerce of that city in the bringing of new industries to Rochester. Mr. McKelvey was associated for 45 years with the American Woodworking Machinery Co., Rochester, holding its presidency from 1901 until 1925 when the company was assimilated by the Yates-American Machinery Co. He held the presidency of the latter company for a year, resigning recently in order to devote his full time to the foundry company and other businesses in which he is interested.

F. Rees Phillips, vice-president for several years of the Perry, Buxton, Doane Co., Philadelphia dealer in iron and steel scrap, and a director and stockholder since its organization in 1912, has resigned.

Student Engineers and Architects to Visit the United States

The first group of student architects and engineers from Czechoslovakia will reach New York early in the spring, it is announced by Milton B. Medary, Jr., Philadelphia, president of the American Institute of Architects. The first contingent, representing architects, will study various phases of American architecture, ranging from the building of small houses up to the largest steel and reinforced concrete construction.

The engineers, who will arrive later, are also being selected from the students of the Masaryk Academy of Work and will be placed in industrial plants for practice work, according to L. W. Wallace, executive secretary of the American Engineering Council, which will assist in placing the young men.

Continental Iron Works to Discontinue Business

The Continental Iron Works, West and Calyer Streets, Brooklyn, one of the oldest builders of marine equipment in the New York district, will discontinue operations on March 1 and its equipment and property will be offered for sale. The company was founded in 1859 by Thomas Fitch Rowland, and has figured prominently in shipbuilding operations since that time. During the Civil War, the *Monitor* was built at the plant. A cessation in shipbuilding activity since the close of the late war is responsible for the closing of the plant. T. F. Rowland is president of the company; George A. Tibbals, vice-president, and Fred B. Slocomb, secretary.

OBITUARY

POWELL STACKHOUSE, identified for more than 50 years with the Cambria Steel Co., Johnstown, Pa., and for many years its president, died Feb. 4 at St. Petersburg, Fla., where he had gone to recuperate from a recent illness. Born in July, 1840, at Philadelphia, he was educated in the public schools of that city and at the age of 16 entered the employ of Wood, Morrell & Co., at that time lessee of the Cambria Iron Works. After working for some time in the company store, and later in the general office, his career was interrupted by the Civil War and he enlisted in the Third Pennsylvania Volunteer Infantry, serving throughout the war and rising to the rank of major in the 198th Pennsylvania Infantry. In 1866 he became superintendent of the Johnstown Mfg. Co., a subsidiary of the Cambria Iron Co., and in 1868 was made assistant superintendent of the parent company. Resigning this position Dec. 31, 1873, he became general agent of the Republic Iron Co., Marquette, Mich., where he served for three years. In 1878 he returned to the Cambria Iron Co. as assistant and acting general manager and served successively as comptroller, vice-president and president, having been elected to the latter position in 1892. In 1898 he was made president of the Cambria Steel Co., a position which he held until 1910. He had also been president of the Mahoning Ore & Steel Co. and had served on the board of a number of companies affiliated with the steel industry. He was for many years auditor of the American Iron and Steel Association, and served for a time as vice-president of the American Iron and Steel Institute. Since 1910 he had gradually retired from business activity and in recent years had lived in comparative retirement at Germantown, Pa.



POWELL STACKHOUSE

JAMES G. BATEMAN, assistant New York district sales manager for the National Tube Co., died Feb. 1 at the Engineers' Club of New York, where he made his home. He was vice-president of the club. He was 50 years of age and had been associated with the Tube company for 20 years.

MATTHEW J. O'NEILL, formerly treasurer and general manager of the Industrial Press, New York, publisher of *Machinery*, died Feb. 3. He became associated with that company in 1898, but withdrew in 1924 to establish a business of his own. At the time of his death he was the owner of *American Printer*.

GRAM CURTIS, for many years chief engineer Newcastle works, Carnegie Steel Co., died at his home at Drexel Hill, Pa., on Jan. 31. He was born at New York in 1844, and, following graduation from Cornell University in 1872, he was employed by Alexander L. Holley in the designing and building of Bessemer plants at Troy, N. Y., Joliet, Ill., and Braddock, Pa. In 1885 he became associated with J. P. Witherow & Co., Newcastle, Pa., now the Pennsylvania Engineering Works. Becoming chief engineer of the Shenango Valley Steel Co., Newcastle, in 1897, he remained with the company after it was absorbed by the United States Steel Corporation, and became the Newcastle works of

the Carnegie company. From 1916 until his retirement in 1925 he engaged in a private consulting engineering practice, devoting his interest to the Bessemer process in which he had always been engaged.

HENRY BRADFORD SARGENT, president and general manager of Sargent & Co., New Haven, Conn., hardware manufacturer, died Feb. 3 in a New Haven hospital. He was born in New York in 1851 and, following early training in New Britain and New Haven schools, he was graduated from the Sheffield Scientific School of Yale University in 1871. Immediately after graduation he began work in the shops of the Sargent company, of which his father was president, as general inspector of products. Later he was made assistant superintendent and in 1887 became vice-president. He had been president of the company since 1917. Mr. Sargent was a member of the American Society of Mechanical Engineers, and prominent in the metal trades associations, as well as in civic and social affairs at New Haven, particularly in the activities of his university.



H. B. SARGENT

SHIRAS MORRIS, president and treasurer Hart & Hegeman Mfg. Co., Hartford, Conn., died Feb. 2 at his home in West Hartford. He was born at Pittsburgh in 1875 and removed to Hartford with his family, when a young man. He was graduated from Trinity College, Hartford, in 1896, and served in the navy during the Spanish-American war. Mr. Morris was a director of the Terry Steam Turbine Co., and the Sesamee Co., Hartford, and of the Peck, Stowe & Wilcox Mfg. Co., Southington, Conn. He was for a time a director of the Bristol Brass Co., Bristol, Conn., and of the Billings & Spencer Co., Hartford.

J. W. JOHNSON, president Hoosier Iron Works, Kokomo, Ind., died Jan. 30, following an operation. Beginning his career as a molder, he rose rapidly to the head of the Kokomo Brass Works, the Kokomo Stamped Metal Co., the Hoosier Iron Works and several other companies. He was 58 years of age.

JAMES BYRON COLVIN, who conducted a foundry at 52 Jackson Street, Worcester, Mass., died suddenly Feb. 4, following a long period of poor health. He was born at Whitinsville, Mass., in 1857, and had spent his entire life in the business which was founded by his father in 1872.

FRANK B. PHILBRICK, president Waterville Iron Mfg. Co., Waterville, Me., died suddenly Jan. 31. As a young man he worked as a machinist for the Baltimore Locomotive Works, Baltimore, and later for the Main Central Railroad. In 1873 he and others acquired the Waterville Iron Mfg. Co.

FRIEDEL D. DAY, former freight claim agent for the American Steel & Wire Co., died Feb. 1 at his home in Wilmette, Ill. He was born at Blue Island, Ill., and for many years was in the freight department of the Rock Island Railroad. He became connected with the Steel & Wire company in 1898, but had retired from active business in October, 1924.

STEDMAN S. NEWTON, one of the founders and for many years president of the Luther Grinder Mfg. Co.,

Milwaukee, died Jan. 30 after an illness of more than a year. He was 76 years of age and retired from active business two years ago.

CHARLES DEERING, formerly chairman of the International Harvester Co., Chicago, died Feb. 4 at his winter home in Miami, Fla. He was the son of the founder of the Deering Harvester Co., and following graduation from the United States Naval Academy, was secretary of the company for a number of years prior to its absorption by the International company. He was 75 years of age.

GEORGE G. HARRIS, vice-president J. B. Ford Co., Wyandotte, Mich., died Feb. 2 at the Harper Hospital, Detroit, aged 59 years. He had been associated with the company for 27 years. He was active in social and civic activities at Detroit. A brother, J. J. Harris, is at present general manager of the J. B. Ford Co.

C. J. KNAPP, Western manager *Hardware Age*, with headquarters at Chicago, died Feb. 5, at the Wesley Memorial Hospital in that city, following a brief illness. He had been associated with The Iron Age Publishing Co. and its predecessor, the David Williams Co., for 20 years, all of that time in Chicago. He was born at Canton, Ill., in March, 1879, and owned a newspaper in California for a time after he left school.

HERBERT J. BOGGIS, long identified with the foundry industry in Cleveland and for the last several years associated with the National Founders Association as a traveling representative, died at his home in Cleveland Feb. 2, following injuries received in an automobile accident several weeks ago. He attended Yale University and entered the employ of the Taylor & Boggis Foundry Co. in Cleveland in 1886, becoming secretary of the company in the following year. He was in charge of one of the plants for many years, and upon the death of his father in 1910 assumed full charge of the company of which he was at that time vice-president. Several years ago the company's foundries were taken over by the Consolidated Iron & Steel Mfg. Co. Mr. Boggis was 65 years of age.

J. G. MILLER, Philadelphia, who had been engaged in the selling of pig iron for about 25 years, died Feb. 2 at his home in that city. Recently he had been agent in Philadelphia for the Mystic blast furnace at Everett, Mass. One of his early pig iron connections was with the Adrian Furnace Co., Dubois, Pa., as sales manager. Later he became president of Read, Fears & Miller, Inc., Philadelphia and New York, pig iron selling agent, but retired from that corporation before its absorption by what is now Rogers Brown & Crocker Brothers, Inc., New York. After leaving Read, Fears & Miller, Inc., Mr. Miller headed another pig iron firm known as Miller, Carson & Co., from which he retired to form his own firm, J. G. Miller & Co., whose offices are in the Cunard Building, Philadelphia.

GEORGE W. WHITEMAN, chief inspector of the Pennsylvania Railroad, well known to many in the steel trade, died at Henderson, N. C., on Feb. 5. He was 62 years old and had been in the employ of the Pennsylvania Railroad for 43 years. His home was at 907 South Forty-eighth Street, Philadelphia.

The business outlook for 1927 has been selected for discussion at a luncheon meeting of the New York chapter of the Society of Industrial Engineers, to be held at the Bankers Club, Feb. 15. At a dinner meeting planned for Feb. 22 at Keen's English Chop House, New York, round table discussion will be on the subject of "Industrial Management Methods, Plans and Policies."

The Lima Locomotive Works, Inc., Lima, Ohio, reports a net income in 1926 after depreciation and contingencies of \$1,704,827, equivalent to \$8.08 a share on the 211,057 no-par capital shares, and compared to a loss of \$844,392 in 1925.

Machinery Markets and News of the Works

CAUTIOUS BUYING OF TOOLS

Slight Improvement Noted in Some Markets This Month

Automobile Companies and Railroads Not Providing the Volume Usually Expected at This Time of Year

THE cautiousness with which manufacturers are buying machine tools is noticeable in all sections of the country, but there has perhaps been a slight improvement this month as compared with January in the volume of orders. Inquiries are more numerous in some sections. It is noteworthy that the automobile manufacturers and railroads are not buying as freely as is usually expected at this time of year.

New York

NEW YORK, Feb. 6.

MACHINE tool business has shown no marked improvement in the volume of orders, but inquiries are somewhat more plentiful. Among the orders of the past week were the following: Thirty-one small presses to the subsidiary of a large rubber company; four profiling machines to the Victor Talking Machine Co., Camden, N. J.; die sinking machine to a company at Garwood, N. J.; vertical drill press to a shoe hardware company at Waterbury, Conn.; vertical surface grinder to a manufacturer at Urbana, Ill.; punching machine to a Jersey City company; vertical drill press to the International Harvester Co., Chicago; horizontal boring and drilling machine to Illinois Steel Co., Chicago; 9-in. spindle floor boring machine to National Tube Co., Pittsburgh; 24-in. shaper to Chicago, Milwaukee & St. Paul Railroad; 26-in. x 8-ft. planer to a manufacturer at Oakland, Cal.; gate shear to United States Aluminum Co., Pittsburgh; carwheel lathe to Chicago & Eastern Illinois Railroad; 90-in. quartering machine to New York Central Railroad; 3½-ft. radial drill to a San Francisco company, and a 4-spindle drilling machine to a Chicago company.

The proposed new plant of the Allied Chemical & Dye Corporation, 61 Broadway, New York, at Hopewell, Va., where site recently was secured, will be used for the production of nitrates from gases, and will cost ultimately upward of \$50,000,000, with buildings and machinery, generating plant, machine shop and auxiliary mechanical structures. A large housing development will be carried out for employees at the works.

The Imperial Metal Products Co., 81 Sunswick Street, Long Island City, has awarded a general contract to Merola Brothers, Inc., 2376 First Avenue, New York, for a new one-story plant, 100 x 200 ft., to cost close to \$40,000. F. E. McLean, Oakwood Place, Queens Village, N. Y., is architect.

The Albany Port Commission, Albany, N. Y., is said to have preliminary plans for a new five-story cold storage and refrigerating plant to cost more than \$850,000 with machinery.

Frank Parker, 280 Madison Avenue, New York, architect, has plans under way for a five-story automobile service, repair and garage building, 200 x 200 ft., on West Sixty-first Street, estimated to cost more than \$175,000 with equipment.

Fire, Jan. 25, damaged a portion of the plant and ma-

The Detroit market is dull because of the lack of buying interest among automobile manufacturers, but the machine tool trade entertains hopes that as the purchase of cars for spring delivery increases orders for tools will follow.

In the railroad field there have been a number of orders, but none of large size. The Chesapeake & Ohio and three Western roads are understood to be preparing lists of tool requirements which soon will be placed before the trade for bids.

The United States Steel Corporation has been the buyer of a number of tools for its Illinois Steel Co. and National Tube Co. plants, and a small list for the Illinois Steel Co. is pending at Chicago. The Victor Talking Machine Co., Camden, N. J., has bought four profiling machines. A stamping company which is a subsidiary of a large rubber company has bought 31 small presses.

chinery of the American Iron Nipple Mfg. Co., 159 North Fourth Street, Brooklyn. An official estimate of loss has not been announced.

In connection with an expansion and improvement program for the next five years, involving a sum of \$63,100,000 for completion, the Long Island Railroad Co., Pennsylvania Station, New York, is arranging a fund of \$11,500,000 for the electrification of its freight lines in the city limits; \$2,000,000 for additional power stations and facilities; and \$500,000 for extensions and betterments in locomotive and car repair shops.

The Brooklyn Union Gas Co., 176 Remsen Street, Brooklyn, has plans for a new artificial gas generating plant on tract of more than 100 acres in the Greenpoint section, to cost in excess of \$750,000 with equipment.

The Packard Ignition & Electric Co., 1841 Broadway, New York, has leased space in the building at 27 West Sixtieth Street for a new plant.

E. De Rosa, 15 West Fortieth Street, New York, architect, will soon take bids on general contract for a seven-story automobile service, repair and garage building, 100 x 150 ft., on local site, estimated to cost \$375,000, with equipment.

The Board of Education, 500 Park Avenue, New York, plans the installation of manual training equipment in the proposed three-story high school at Far Rockaway, L. I., estimated to cost \$2,100,000, for which bids will be asked soon on a general contract. William H. Gompert, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect.

The Public Service Electric & Gas Co., Public Service Terminal, Newark, N. J., has secured permission to increase its capital by an amount of \$30,000,000, a large portion of the fund to be used for the merging of companies now controlled by lease and for extensions and improvements.

I. B. Glueckfield, 60 Park Place, Newark, attorney, representing a company, name temporarily withheld, which proposes to construct a local structural iron works, has concluded arrangements for the purchase of a site at 433-55 Frelinghuysen Avenue for the new plant, 325 x 437 ft. It is planned to begin construction at an early date.

Becton, Dickinson & Co., Cornelia Street, East Rutherford, N. J., manufacturer of surgical instruments, has awarded a general contract to Claus Ahrens & Co., 72 Ukland Street, for a one-story top addition to cost about \$21,000.

The Eureka Smelting & Refining Co., Irvington, N. J., has leased the one-story building at 857 Springfield Avenue, Irvington, for a local plant.

The Board of Transportation, 49 Lafayette Street, New York, is planning the construction of an automobile and

motor bus terminal, with repair and reconditioning department, at Sixth Avenue and Fortieth Street, to cost approximately \$1,000,000.

The A. B. C. Weatherstrip Co., Orange, N. J., has been organized as a branch office of the Hoffbauer Co., Inc., 16 East Twelfth Street, New York, manufacturer, distributor and installer of A. B. C. weatherstrips.

The American Adjustable Lockup Corporation, 623 West Twenty-third Street, New York, has been formed to take over the assets and liabilities of the American Adjustable Chase Corporation and will devote itself particularly to the manufacture and sale of a lockup system formerly handled by the other company.

The Dodge Dining Car Co., Hammonton, N. J., has been organized to manufacture steel trailer dining cars or lunch wagons. It has purchased a site at Hammonton and is having plans prepared for a factory building. The company's product will be electrically equipped, and it will be in the market for certain electrical equipment as well as steel products.

The New York Engineering Co. has removed its offices to the New York Evening Post Building, 75 West Street.

New England

BOSTON, Feb. 8.

THE past week was uneventful in the local machine tool market, no sales of new equipment of importance being reported. Business was confined to a single machine here and there, and in the aggregate numbered less than a dozen. There was a noticeable falling off in inquiries, and most of those in the hands of dealers apparently are no nearer closing than a week ago. The trade is optimistic, however, feeling that good bookings will be made later, especially by Massachusetts manufacturers.

It is intimated that New England railways will require equipment this year, but details are lacking. One railroad is reported to be making a survey of its shop equipment with a view to eliminating all machines in service more than 20 years.

Interest in the used equipment field centered very largely in the auction sale of a Springfield, Mass., automobile body manufacturing plant. Most of the equipment brought comparatively high prices. The plant itself was purchased by a representative of an aircraft company.

The Taunton Rubber Co., Taunton, Mass., heels, soles and sponge rubber specialties will increase its capitalization from \$90,000 to \$150,000. It has leased the local plant of the Greenfield Tap & Die Corporation, where sponge rubber specialties and radio parts will be made. Retorts, motors and miscellaneous equipment will be required.

Work has started on a one-story, 80 x 100 ft., paper machinery plant unit by Bird & Sons, Inc., East Walpole, Mass., paper and linoleum. Monks & Johnson, 99 Chauncy Street, Boston, are the engineers.

The Judson L. Thompson Mfg. Co., Roberts Station, Waltham, Mass., is talking bids on a three-story and basement, 50 x 125 ft., machine shop addition. Arthur F. Gray, 33 State Street, Boston, is the architect.

Fay, Spofford & Thorndike, 44 School Street, Boston, engineers, have completed plans for a sewage pumping station to be erected by Gloucester, Mass., for which miscellaneous equipment is required. R. B. Fisher is chairman of the Gloucester board of survey.

The Robins Conveying Belt Co., 15 Park Row, New York, has a contract for a coke bin, 35 x 100 ft. and 70 ft. high, to be erected by the Providence Gas Co., Providence, R. I.

O. F. Mossberg & Sons, 201 Green Street, New Haven, Conn., manufacturers of rifles, pistols, etc., will take bids at once for a one-story addition, 50 x 70 ft., for which plans have been drawn by R. W. Fabian, New Haven, architect.

The Southern New England Ice Co., Bridgeport, Conn., has been formed by interests connected with the Metropolitan Ice Co., Commercial Wharf, Boston, to take over and operate about 30 companies in this line in Connecticut, with artificial ice plants at Bridgeport, Hartford, New Haven, Derby and Waterbury. The properties have a value of about \$5,000,000. The new company is said to be arranging for a new ice-manufacturing plant at an early date. A bond issue of \$2,300,000 and preferred stock issue of \$1,100,000 have been arranged, a portion of the proceeds to be used for the consolidation and expansion program. Howard H. Davenport is president.

The Smith Planing Mills, Brewer, Me., are planning to rebuild their wood-working plants destroyed by fire Jan. 30, with loss reported at \$90,000 including equipment.

Fletcher-Thompson, Inc., 542 Fairfield Avenue, Bridgeport, Conn., architect and engineer, has plans for a three-story automobile service, repair and garage building, 75 x 150 ft., at Westport, Conn., to cost about \$135,000 with equipment.

The Holyoke Water Power Co., Holyoke, Mass., has secured permission for the construction of a hydroelectric generating plant at the Holyoke terminus of the dam across the Connecticut River. The project will include a steel tower transmission line, extending to the vicinity of South Hadley, where power will be furnished. The entire project is reported to cost more than \$400,000. Robert E. Barrett is president.

The Lowell Gas Light Co., Lowell, Mass., has acquired a portion of the former Prescott mill of the Massachusetts Cotton Mills, and will remodel and equip in part. The work will cost in excess of \$200,000.

The Rhode Island Public Service Co., Providence, R. I., has arranged for a preferred stock issue to total about \$15,000,000, a portion of the fund to be used for extensions and improvements in plants and system. The company is a consolidation of the Narragansett Co. and the United Electric Railways Co. L. C. Gerry is president.

Chicago

CHICAGO, Feb. 7.

ORDERS for machine tools are less numerous than a week ago and new inquiry is sluggish from all classes of users. Prospective business carried over from January is of fair proportions, but is slow in being entered as actual orders. The railroads are inactive although it is reported that at least three sizable lists are being prepared.

The Illinois Steel Co. has issued a small list which includes four 36-in. x 17-ft. heavy-duty lathes, one 48-in. x 16-in. spur gear and pinion cutter, a 36-in. x 36-in. x 8-ft. heavy-duty planer, a No. 4 miller, a 14-in. keyseat milling machine, a 24-in. shaper and a 50-in. chuck grinder.

The Standard Gas & Electric Co., is planning construction expenditures for the year to total \$61,500,000. Engineering and construction work is in charge of H. W. Fuller, vice-president Bylesby Engineering & Management Corporation, 231 South La Salle Street, Chicago.

The Village Council, Dupon, Ill., will soon call for bids for two centrifugal pumps and a 100,000-gal. capacity elevated steel tank and tower. The entire project will cost \$125,900. Sheppard & Morgan, Alton, Ill., are engineers.

The City Council, Eagle Falls, Iowa, is having plans drawn for the construction of a municipal electric light and power plant to cost \$125,000. H. L. Cory & Co., Aberdeen, S. D., are engineers.

The Central Iron Co., Rockford, Ill., will build a one-story machine shop, 50 x 150 ft. A. Buske, is general manager.

The Solem Machine Co., 158 Morgan Street, Rockford, Ill., will soon begin the erection of a one-story machine shop addition, 80 x 335 ft., sawtooth roof type, to cost about \$50,000. Peterson & Johnson, Swedish-American Bank Building, are architects.

Fire, Jan. 26, destroyed a portion of the plant of the Quincy Enameling Co., Quincy, Ill., with loss estimated at \$50,000 including equipment. Plans are being considered for early rebuilding.

The International Harvester Co., 606 South Michigan Avenue, Chicago, has work under way on a six-story and basement factory branch and distributing plant at Des Moines, Iowa, 88 x 150 ft., to cost \$175,000, with equipment.

The Certain-Teed Products Corporation, St. Louis, has awarded a general contract to the Wimmer Construction Co., Victoria Building, for a one-story factory branch and distributing plant, 125 x 240 ft., at Marseilles, Ill., to cost about \$100,000 with equipment. The company manufactures roofing and kindred products, with headquarters at 100 East Forty-second Street, New York.

The J. S. Heath Co., Market Street, Waukegan, Ill., manufacturer of brass and other metal goods, is completing the erection of a one-story addition costing about \$50,000, and plans the early installation of equipment.

The Board of Trustees, Northwestern University, Evanston, Ill., is contemplating the erection of a number of new buildings, to include the Armour College of Engineering with complete electrical and mechanical facilities, estimated to cost \$10,000,000.

The Crane Market

INQUIRY for overhead and locomotive cranes continues small, and prospective purchasers are slow to place business. The Lidgerwood Mfg. Co., 96 Liberty Street, New York, has not yet closed on its list of three 10-ton and one 25-ton electric overhead cranes for a new plant. The used crane market is showing slightly more activity than the new equipment field. Sellers of used locomotive cranes report a good volume of inquiry, and in used overhead cranes there is an inquiry current from the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., for a 5-ton, 32-ft. span gantry crane to handle a magnet. Another inquiry for used overhead equipment is from the Patterson Foundry & Machine Co., East Liverpool, Ohio, for two 25-ton, 50-ft. span overhead cranes, one with a 5-ton auxiliary.

Among recent purchases are:

General Electric Co., Schenectady, N. Y., a 10-ton, 30-ft. span, 3-motor overhead crane from the Niles-Bement-Pond Co.

Westinghouse Electric & Mfg. Co., Sharon, Pa., a 3-ton electric overhead crane from the Whiting Corporation.

Youngstown Sheet & Tube Co., four 10-ton, 77-ft. span,

double-hook, overhead cranes from the Morgan Engineering Co.

Mathieson Alkali Co., Saltville, Va., a 20-ton, 50-ft. span electric crane from the Northern Engineering Works.

Otis Steel Co., Cleveland, an open-hearth charging machine for low type floor, from the Morgan Engineering Co.

United Engineering & Foundry Co., Youngstown, a 10-ton overhead crane with 3-ton auxiliary, from the Milwaukee Electric Crane & Mfg. Co.

American Rolling Mill Co., Ashland, Ky., a 15-ton, 82-ft. span overhead crane with a 10-ton auxiliary, from the Morgan Engineering Co.

Bethlehem Steel Co., Bethlehem, Pa., a charging and drawing crane for Sparrows Point, Md., and a 20-ton trolley for Buffalo, N. Y., from the Morgan Engineering Co.

Cohoes Rolling Mill Co., Cohoes, N. Y., a 7½-ton, 25-ft. span overhead crane from the Morgan Engineering Co.

Jones & Laughlin Steel Corporation, Pittsburgh, a 60-ton trolley, two stripping cranes and a revolving crane from an unnamed builder.

The City Council, Thief River Falls, Minn., is planning an early call for bids for extensions and improvements in the municipal electric light and power plant, including the installation of additional machinery, reported to cost about \$85,000 with equipment. The Jacobson Engineering Co., 430 Oak Grove Street, Minneapolis, Minn., is engineer.

The Board of Education, Virginia, Minn., is planning the installation of manual training equipment in a proposed two-story and basement junior high school estimated to cost \$700,000, for which bids will be asked on a general contract in the near future. E. H. Berg, 407 Jones Street, Eveleth, Minn., is architect.

The Rockford Malleable Iron Works, People Avenue, Rockford, Ill., is said to have decided not to rebuild its machine shop, recently destroyed by fire.

The Ayer & Lord Tie Co., Carbondale, Ill., plans extensions and improvements in its power house, including the installation of additional equipment. Douglas & Kryster, Tribune Tower Building, Chicago, are engineers.

Detroit

DETROIT, Feb. 7.

THE Palmer-Bee Co., 2778 East Grand Boulevard, Detroit, manufacturer of power transmission and conveying machinery, is considering plans for a new one-story plant, 100 x 120 ft., to cost about \$70,000 with equipment. W. E. Bee is president.

The Roxana Petroleum Corporation, Arcade Building, St. Louis, will build a new storage and distributing plant at Muskegon, Mich., to cost about \$200,000 with machinery.

The American Piston & Machine Co., 1840 Garfield Street, Detroit, has completed arrangements for the removal of its plant to Alpena, Mich. A new company will be organized with capital of \$75,000 to take over and expand the present concern. Charles E. Stead will be president and manager; Richard Piepkorn, vice-president; J. H. Besser, secretary, and Robert Polzin, treasurer.

The J. W. Cook Corporation, Genesee Bank Building, Flint, Mich., architect, has plans for a five-story automobile service, repair and garage building, 90 x 165 ft., to cost about \$170,000.

The Perry & Son Boat Works, Pearl Beach, Mich., is considering rebuilding the portion of its plant recently destroyed by fire, with loss estimated at \$50,000 including equipment.

The Willard Battery Service, Holland, Mich., has work under way on a new one-story and part basement service and repair works, 70 x 105 ft., to cost about \$33,000 with equipment. B. H. Levenson is in charge.

The Board of Education, L'Anse, Mich., plans the installation of manual training equipment in its proposed three-story and basement high school, estimated to cost \$300,000, for which bids have been asked on a general contract. F. E. and G. E. Parmalee, First National Bank Building, Iron Mountain, Mich., are architects.

The Albion Gas Light Co., Albion, Mich., has plans under way for a new artificial gas generating plant to double the present capacity, estimated to cost \$250,000 with equipment.

It is purposed to begin work in the spring. Roy Campbell, Three Rivers, Mich., is president.

The Port Huron Corporation, Port Huron, Mich., is starting production this month in the plant formerly owned by the Port Huron Engine & Thresher Co., South Park, Port Huron, and will make steel grain threshers. The Port Huron Corporation was recently organized with capital stock of \$1,000,000. Its officers are: Owen J. Stocking, Chicago, president; Erwin L. Willson, Port Huron, vice-president; Herbert N. Ewing, Chicago, secretary and treasurer. James Fitzgerald is factory superintendent.

The W. B. Mershon Co., Saginaw, Mich., has been organized to succeed William B. Mershon & Co., and will continue the manufacture of band-sawing machinery. They will be marketed by the S. A. Woods Machinery Co., Boston, of which the Mershon company is a division.

Buffalo

BUFFALO, Feb. 7.

PLANs have been filed by the Great Lakes Portland Cement Co., 999 Hamburg Turnpike, Buffalo, for several new buildings at its plant, now in course of erection, including kiln building to cost \$90,000; coal-handling plant; storage and distributing building, \$35,000; coal storage and distributing department, \$24,000; pumping plant; oil storage and distributing building, and other structures.

H. E. Plumer, 700 Main Street, Buffalo, architect and engineer, has plans under way for a three-story automobile service, repair and garage building, 150 x 200 ft., to cost about \$165,000 with equipment.

The Board of Education, Forestville, N. Y., is considering the installation of manual training equipment in a proposed new three-story high and grade school estimated to cost \$170,000, for which plans are being prepared by F. A. Spangenberg, 250 Delaware Avenue, Buffalo, architect.

The Rand Kardex Co., Tonawanda, N. Y., manufacturer of office filing equipment, etc., is having plans drawn by E. Carlson, 374 Main Street, architect, for an addition to its plant at Niagara Falls, Ont., to cost about \$175,000 with equipment.

The Binghamton Light, Heat & Power Co., Binghamton, N. Y., has approved plans for an addition to its steam-operated electric power house, to increase the capacity by about 30,000 kw., to cost more than \$400,000. The company is operated by the General Gas & Electric Corporation, 50 Pine Street, New York. W. S. Barstow is president.

Charles E. Dickinson, Ashley Building, Lockport, N. Y., will ask bids soon for a two-story automobile service, repair and garage building, to cost about \$115,000 with equipment. Revised plans are being completed by H. E. Plumer, 700 Main Street, Buffalo, architect and engineer.

Taggart Brothers, Inc., Watertown, N. Y., manufacturer of wrapping papers, paper bags, etc., has plans under way for its new two-unit mill at Oswego, N. Y., reported to cost in excess of \$1,000,000 with machinery. It is understood that bids will be asked early in the spring. E. C. Whitney, Oswego, is architect.

Homer Strong & Co., Inc., 235 State Street, Rochester, N. Y., is inquiring for a used 250- to 300-ton horizontal hydraulic wheel press, either belt or motor driven.

Milwaukee

MILWAUKEE, Feb. 7.

MACHINE-TOOL builders express satisfaction with the way new business is developing. The automotive industries are again becoming interested in new equipment, and inquiry is of a character that suggests sales beyond replacement requirements. Foundries and machine shops in this locality are making gains in the number employed. Twenty-seven plants show an increase of 915 at the beginning of February compared with Jan. 1.

The Silver Iron & Steel Co., 1700 Holburn Street, Racine, Wis., sustained an estimated loss of \$20,000 by fire in its warehouse and garage on Jan. 30. Considerable damage was done to machinery and equipment. Reconstruction will begin at once.

Philadelphia

PHILADELPHIA, Feb. 7.

THE Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has closed negotiations for the purchase of about 90 acres in the Wilmington, Del., district, and will develop a portion of the site for a new terminal yard in connection with the electrification of its line between Philadelphia and Wilmington. Facilities will be provided for repairs, reconditioning, etc.

The Stern Metal Mfg. Co., 525 North Ninth Street, Philadelphia, is having plans drawn by Samuel Abraham, 2315 Walnut Street, architect, for a one-story addition and improvements in the present factory.

The Central Construction & Supply Co., 2222 Arch Street, Philadelphia, has plans under way for extensions and improvements in its four-story plant at 1238-46 Belmont Avenue, to cost about \$30,000 with equipment. T. Shipley, president, is in charge. E. H. Poggi, 1523 Locust Street, is architect.

The Gulf Refining Co., Locust Street, Philadelphia, has filed plans for a one-story machine shop at Penrose Ferry Road and East Schuylkill Avenue, to cost about \$13,000 with equipment.

The Allen Corporation, 309 South Fifteenth Street, Philadelphia, manufacturer of calculating machines and parts, has leased a portion of the building recently completed at 233-45 Spring Street, New York, totaling 20,000 sq. ft. of floor space, for a new factory branch. The company lately acquired the plant and business of the Wales Adding Machine Co., Wilkes-Barre, Pa.

Bertram Ireland, Guarantee Trust Building, Atlantic City, N. J., architect, is preparing plans for a three-story automobile service, repair and garage building, 50 x 150 ft., to cost about \$115,000 with equipment.

The Board of Education, Princeton, N. J., is said to be considering the installation of manual training equipment in a proposed new high school to cost close to \$500,000, for which plans are being drawn by Ernest Sibley, Bluff Road, Palisade, N. J., architect.

The Public Service Electric & Gas Co., Trenton, N. J., has plans for a two-story addition to its power plant on Chauncey Street, to cost approximately \$80,000 with equipment. Headquarters are in the Public Service Terminal, Newark, N. J.

The Certain-Teed Products Co., Second Street and Erie Avenue, Philadelphia, manufacturer of roofing, etc., is preparing plans for a three-story factory branch, with storage and distributing facilities at York, Pa., to cost \$150,000 with equipment. Klipstein & Rathman, Security Trust Building, St. Louis, are architects.

The Board of Education, Keystone Building, Philadelphia, is said to be planning the installation of manual training equipment in the addition to be erected at the West Philadelphia high school to cost in excess of \$350,000, for which bids have been asked on a general contract. Irwin T. Catharine, address noted, is architect for the board.

The Reading Co., Reading Terminal, Philadelphia, is arranging a fund of about \$28,000,000 for expansion during 1927, the majority of the appropriation to be expended for equipment, tools, supplies, etc.

The Wilkes-Barre Railway Co., Wilkes-Barre, Pa., has plans for a one-story machine shop, 120 x 201 ft., at Kingston, Pa., to cost about \$25,000 with equipment. A portion of the structure will be equipped for woodworking.

The City Council, Reading, Pa., is said to be considering the installation of electrically-operated pumping machinery and other power equipment in connection with proposed extensions in the sewage disposal plant and system. The

cost of the initial work will approximate \$200,000; the entire project is estimated at \$900,000.

The Pottsville School District, Pottsville, Pa., proposes the installation of manual training equipment in a new two-story and basement high school to cost \$900,000, for which Lawrie & Green, 116 Locust Street, Harrisburg, Pa., are architects.

The American Brown Boveri Electric Corporation, 165 Broadway, New York, is arranging to discontinue the fabrication of structural steel at its Camden, N. J., plant, and will increase local departments for the manufacture of heavy electrical machinery. Shipbuilding operations will be continued, including construction of all-steel electric ferry-boats. The company is reported to be negotiating for a controlling interest in the Lima Locomotive Co., Lima, Ohio, manufacturer of industrial locomotives. Laurence R. Wilder is president.

South Atlantic States

BALTIMORE, Feb. 7.

CONTRACT has been let by the Lanham Hardwood Flooring Co., Inc., Twelfth and Magnolia Streets, Louisville, to Edward J. Winkler, Fullerton, Md., for a one-story factory branch at Baltimore, 98 x 100 ft., to cost close to \$50,000. E. G. Blanke, 801 North Calvert Street, Baltimore, is architect.

Ovens, power equipment, elevating and conveying machinery will be installed in the proposed two-story and basement plant, 100 x 175 ft., to be erected at Charlotte, N. C., by the American Bakeries Co., Healey Building, Atlanta, Ga., to cost about \$200,000. Charles C. Hook, Johnston Building, Charlotte, is architect.

Bids have been asked by Crosse & Blackwell, Ltd., 146 West Twenty-second Street, New York, for its proposed three-story factory at Baltimore, with power plant, 56 x 70 ft. The entire project will cost close to \$500,000 with machinery. Clark, MacMullen & Riley, 101 Park Avenue, New York, are engineers.

The Board of Education, Charlotte, N. C., contemplates the installation of manual training equipment in a proposed junior high school in Irwin Park estimated to cost \$200,000.

The Georgia Railway & Power Co., Atlanta, Ga., will soon begin the construction of new car repair shops, including welding works, car barns and other buildings at its Cherokee yards, to cost \$400,000 with equipment.

The National Aeronautic Association, 1623 H Street, N. W., Washington, Porter Adams, president, is contemplating the erection of a new airport terminal in this vicinity, including shops, hangars, etc., reported to cost in excess of \$750,000.

The Industrial Engineering & Sales Corporation, 2208 Colonial Avenue, Norfolk, Va., manufacturer of automobile accessories, has plans for an addition, 50 x 110 ft., to cost close to \$40,000 with equipment. The installation will include lathes, drill press, stamping machine, nickel-plating equipment and other tools.

A. F. N. Everett, Candler Annex, Atlanta, Ga., architect, is preparing plans for a one-story and basement automobile service, repair and garage building, 125 x 205 ft., to cost \$80,000 with equipment. S. S. Stover, Marietta Building, is engineer.

The addition to be constructed by the Carolina Steel & Iron Co., Greensboro, N. C., will be 45 x 140 ft., instead of smaller size, previously noted, and will be used primarily for a steel fabricating works. It will cost approximately \$275,000.

L. C. Lawrence, Marion, S. C., and associates are planning the purchase of lathes and other woodworking tools for the manufacture of handles. A building has been leased and work will begin soon.

The R. S. Armstrong & Brother Co., 676 Marietta Street, Atlanta, Ga., machinery dealer, has inquiries out for a 50-kw. electric generator, belt-driven.

The Bost Building Equipment Co., Independence Building, Charlotte, N. C., plans the installation of a number of wood-working tools in a new shop.

The South Carolina Power Co., Charleston, S. C., has plans for an addition to its local steam-operated electric generating station, with capacity of 10,000 kw., doubling the present output, estimated to cost in excess of \$275,000. The company has been disposing of a bond issue of \$4,000,000, a portion of the fund to be used for expansion.

The Fort Valley Consolidated School District, Fort Valley, Ga., plans the installation of manual training equipment in a proposed new high school, for which bids are being asked on general contract, reported to cost about \$175,000. Lockwood & Poundstone, Forsyth Building, Atlanta, Ga., are architects.

The Hackley Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for a steam hoist; a number of water-tube boilers of 300-350 hp. capacity, and Scotch type, same size.

The Best Building Equipment Co., 519 Realty Building, Charlotte, N. C., has been incorporated to manufacture door and window screens, metal weatherstrip and kindred equipment. Some machinery will be purchased.

Cincinnati

CINCINNATI, Feb. 7.

THE gradual upward trend in machine tool sales continued the past week and indications are that further improvement will take place as the month progresses. Most purchases have involved only single machines, but the total volume has been the best in many weeks. Increased attention is being given to the Detroit district, because of several important pending deals with automobile manufacturers. In fact, business from the automotive industry this month is expected to show a substantial increase.

That considerable railroad buying will open up in the next two months is the opinion of local manufacturers. The New York Central has contracted for four engine lathes and a 90-in. quartering machine, and is expected to close for other equipment in the near future. The Baltimore & Ohio is understood to be contemplating the purchase of a number of tools, although no formal inquiry has been issued. Another carrier which probably will put out a list soon is the Chesapeake & Ohio. The Chicago & Eastern Illinois has bought a No. 4 carwheel lathe.

A local builder has sold four 17-in. lathes to an automobile maker. Another order for four automatic lathes has been received locally from an Eastern company, and a Cincinnati machine tool company has booked two large engine lathes for delivery to Australia. The National Tube Co., Pittsburgh, is the buyer of a 7-in. spindle horizontal boring, drilling and milling machine. The Delco-Remy Co., Dayton, Ohio, has purchased a 7-in. Pratt & Whitney shaper. The sale of a 60-in. planer in this market is reported.

The Cleveland, Cincinnati, Chicago & St. Louis Railroad Co., Cincinnati, will proceed with the construction of a one-story machine repair shop on Hillside Street, to cost \$45,000 with equipment.

The Schott Auto Co., 2412 Gilbert Avenue, Cincinnati, has awarded a general contract to the Miller & Son Co., 2017 Elm Street, for a one-story service, repair and garage building, to cost \$130,000. Rendigs, Panzer & Martin, Southern Ohio Bank Building, are architects.

The Kentucky Aircraft Corporation, 701 East Main Street, Owensboro, Ky., has awarded a general contract to the L. A. Monarch Co., Owensboro, for four additions, each one story, to be equipped for body manufacture, wing and tail surfaces, and auxiliary apparatus. The present assembling department will be increased to provide a total floor area of about 5000 sq. ft. J. W. Whitehead, Owensboro, is architect.

Sears, Roebuck & Co., Chicago, manufacturers and mail-order distributors of knock-down houses, agricultural implements, etc., are considering plans for a new storage and distributing plant at Memphis, Tenn., to cost in excess of \$1,500,000 with equipment.

The Board of Works, Middletown, Ohio, is planning to purchase a new pumping unit for the municipal water plant. Earl Gebhart is waterworks superintendent.

The Morristown Turning Co., Morristown, Tenn., has acquired property on West Main Street, and contemplates the early erection of a new one-story wood-working and turning plant, 100 x 202 ft., to cost about \$30,000 with machinery.

The Lexington Utilities Co., Lexington, Ky., operating electric light and power properties, is planning for a bond issue of \$3,750,000, a portion of the proceeds to be used for extensions and improvements.

The Board of Education, Columbus, Ohio, contemplates the installation of manual training equipment in a proposed new junior high school at North Fourth Street and Twentieth Avenue, to cost \$500,000, for which plans are being drawn by Howard Dwight Smith, 270 East State Street, architect.

The Cincinnati Oil Works, Eggleston Avenue, Cincinnati, has awarded a general contract to the Fisher-DeVore Co., Dixie Terminal Building, for a six-story and basement storage and distributing plant, 70 x 150 ft., to cost about \$200,000.

Indiana

INDIANAPOLIS, Feb. 7.

BIDS will soon be asked by the B. & F. Mfg. Co., 2018 Massachusetts Avenue, Indianapolis, manufacturer of plumbing equipment and supplies, for a one-story foundry, 60 x 110 ft., to cost about \$45,000. An overhead conveyor of 7 tons capacity will be installed. Doeppers & Lennox, 226 East Michigan Avenue, are architects. L. S. Foerderer is secretary and treasurer.

The Board of Education, Delphi, Ind., plans the installation of manual training equipment in a new two-story and basement consolidated high school to cost \$160,000, for which bids will soon be asked on a general contract. O. P. Gordon, Thayer Building, Greenfield, Ind., is architect.

The Reo Automobile Co., 927 North Meridian Street, Indianapolis, has leased a one-story building, 60 x 160 ft., to be erected by the Library Realty Co., State Saving & Trust Building, and will equip for a machine repair shop and service works. It will cost close to \$50,000 with equipment. Vonnegut, Bohn & Mueller, Indiana Trust Building, are architects.

The New York Central Railroad Co., Grand Central Terminal, New York, has plans under way for a new engine house and locomotive repair shops at Elkhart, Ind., to cost about \$75,000 with equipment.

The Universal Brass Works, 139 South East Street, Indianapolis, has awarded a general contract to the J. E. McGaughey Co., American Central Life Building, for a new one-story foundry, 65 x 105 ft., to cost about \$28,000 with equipment. Harry Meyer is president, and E. S. Harter, secretary.

The Home Telephone & Telegraph Co., Fort Wayne, Ind., is planning for a new two-story equipment storage and distributing plant, with repair, testing and other operating departments, 130 x 175 ft., to cost \$100,000. Charles Weatherhogg, 250 West Wayne Street, is architect.

Rodney Leonard, People's Life Building, Frankfort, Ind., architect, has plans under way for a six-story and basement automobile service, repair and garage building, 75 x 142 ft., to cost \$130,000 with equipment.

The Anderson & Vaile Stamping Co., Hammond, Ind., has arranged with the Harter Industrial District, Hammond, for the erection of a new one-story plant, 150 x 355 ft., to be occupied under lease, estimated to cost \$140,000 with equipment. A general contract has been let to William Collins, Hammond. It is purposed to remove the present works to the new location and provide for considerable increase in production.

The Montpelier Foundry & Machine Co., Fort Wayne, has been incorporated to succeed the Montpelier Mfg. Co., Montpelier, and will continue to make gray iron castings, Page pumps and parts and canvas and expanso cups for use in oil fields. The company has a capacity in excess of 550 tons per month, and will devote special attention to pattern and machine work.

Gulf States

BIRMINGHAM, Feb. 7.

WORK will soon begin on new locomotive and car repair shops at Fort Worth, Texas, for the Texas & Pacific Railway Co., Dallas, Tex., in connection with a new classification and terminal yard at that place. The entire project, with terminal yard will cost more than \$3,500,000. E. F. Mitchell is chief engineer.

The Southern Ice & Utilities Co., Santa Fe Building, Dallas, Tex., is considering the erection of a one-story ice-manufacturing and cold storage plant at Muskogee, Okla., to cost about \$100,000 with equipment. The company has arranged also for the construction of similar plants at Nashville and Prescott, Ark., each to cost in excess of \$120,000 with machinery. J. M. Allen is general manager.

The Western Cotton Oil Mill, Union Stock Yards, San Antonio, Tex., has plans for the construction of a two-story cottonseed oil mill to cost about \$45,000 with machinery. Richard V. Straton, Travis Building, is architect.

The Latex Gas Co., Latex, Tex., operated by the Magnolia Gas Co., Orange, Tex., is considering the construction of a pipe line to the vicinity of Dallas, Tex., about 200 miles, with compressor and booster stations, etc. The entire project is reported to cost more than \$300,000.

The C. A. Bain Roofing & Furnace Heating Co., First Avenue, Birmingham, will proceed with a new one-story plant, 50 x 125 ft., to cost about \$18,000.

The N. O. Nelson Mfg. Co., Linden Avenue, Memphis, Tenn., manufacturer of plumbing equipment and supplies, has awarded a general contract to Beckelheimer & Small, Gulfport, Miss., for a one-story factory branch and dis-

tributing plant at Jackson, Miss., 100 x 150 ft., to cost about \$45,000. N. W. Overstreet, Mississippi Fire Insurance Co. Building, Jackson, Miss., is architect.

The Board of Education, McAllen, Tex., plans the installation of manual training equipment in a new three-story and basement high school to cost \$200,000, for which foundations will soon be laid.

The Chipley Lime Products Co., Tallahassee, Fla., has acquired a tract of lime rock deposits in Washington County and plans the early installation of machinery for development and operation, including drills, steam shovel, industrial locomotive, etc. A crushing plant is also contemplated. The entire project is reported to cost more than \$80,000.

Fire, Jan. 29, destroyed the factory branch and distributing plant of the Simmons Co., Tampa, Fla., with loss estimated at \$40,000. It is proposed to rebuild. Headquarters are at Kenosha, Wis.

The Lone Star Ice & Fuel Co., Fort Worth, Tex., will soon begin the construction of a one-story ice-manufacturing plant to cost approximately \$60,000 with equipment.

The Alamo Concrete Pipe Co., Gonzales, Tex., has plans for a new one-story plant, 100 x 175 ft., at San Antonio, Tex., for the manufacture of reinforced-concrete pipe to cost about \$30,000 with machinery.

The W. K. M. Co., West Building, Houston, Tex., manufacturer of oil well equipment and supplies, has plans for a new storage and distributing plant, one story, 85 x 125 ft., to cost about \$35,000.

The Board of Education, Edinburg, Tex., plans the installation of manual training equipment in a proposed new junior high school and junior college, estimated to cost \$350,000, for which foundations will soon be laid. Giesecke & Harris, 207 West Seventh Street, Austin, Tex., are architects. H. C. Baker is superintendent.

The Jackson Machinery Co., Jackson, Miss., has inquiries out for a 1000-hp. stationary engine, uniflow type, direct-connected to generator.

Pittsburgh

PITTSBURGH, Feb. 7.

MACHINE tool sales still are below expectations, based on the amount of inquiries carried over from last year and which have developed since. Quotations have been made against a large amount of business, but actual sales have been few since the first week of the year. Heavy equipment is doing well. The Jones & Laughlin Steel Corporation has bought a 45-in. universal mill for its Pittsburgh works.

Plans are being considered by the Pittsburgh Die Casting Corporation, 7505 Ardmore Street, Swissvale, Pa., for a new one-story plant, to cost in excess of \$45,000 with equipment. Frank N. Townsend is one of the heads of the company, in charge.

The Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, is arranging for the enlargement of its Colfax steam-operated electric generating plant at Cheswick, Pa., to increase the output from 190,000 to 270,000 kw. The work will be carried out in connection with an expansion program during 1927 to cost about \$26,000,000. Plans will be under the direction of the Byllesby Engineering & Management Corporation, Chicago.

The Parkersburg Rig & Reel Co., Parkersburg, W. Va., manufacturer of oil derricks and oil well machinery, has awarded a general contract to the Austin Co. for the construction of a branch plant at Casper, Wyo., estimated to cost \$100,000 with equipment. The company is also carrying out an expansion program at its Parkersburg works, consisting of a one-story unit, 125 x 240 ft.; with other structures to be erected later, the total cost approximating \$450,000. H. J. Lockhart is vice-president and general manager.

The Vitrolite Co., Chamber of Commerce Building, Chicago, manufacturer of cast table tops, etc., has plans for the immediate erection of a one-story addition to its plant at Parkersburg, 150 x 300 ft., estimated to cost \$110,000 with machinery. It is purposed to construct another unit in the near future, to be equipped primarily as a casting shop. Frank A. King is plant superintendent.

T. Edward Cornelius, Magee Building, Pittsburgh, architect, has plans under way for a three-story and basement automobile service, repair and garage building, 100 x 125 ft., to cost about \$200,000, for which bids will soon be asked on a general contract.

The Guyan Machine Shops, Logan, W. Va., machinery dealer, is inquiring for a quantity of cold rolled shafting, a

milling saw to handle material up to 9 in. diameter; 80-hp. horizontal return tubular boiler, industrial motors and other mechanical equipment.

The Standard Power & Light Corporation, Pittsburgh, operating the Philadelphia Co., 435 Sixth Avenue, and other utility interests, is disposing of a bond issue of \$24,000,000, a portion of the proceeds to be used for extensions and improvements.

The Uniflow Pump & Mfg. Co., Erie, Pa., has been formed to manufacture pumping and water systems. The company has purchased a manufacturing building, and will make no additions at the present time.

The A. W. Cadman Mfg. Co., Pittsburgh, has sold its valve specialty manufacturing business to the Barrett Machine Co., specialty division, 1430 Oliver Building, Pittsburgh. The Cadman company will hereafter devote its efforts to the founding of brass and bronze castings and babbitt metals, and the valve finishing plant will be reconstructed as an addition to the brass and bronze foundry.

St. Louis

ST. LOUIS, Feb. 7.

PLANs are under consideration by the Pague Mfg. Co., Southwest Boulevard and Twenty-ninth Street, Kansas City, Mo., manufacturer of pails, cans, etc., for a one-story factory, 130 x 155 ft., to cost about \$45,000. F. L. Woodward is general manager.

The Warren Cotton Oil & Mfg. Co., Warren, Ark., will rebuild the portion of its plant destroyed by fire Jan. 23, with loss reported in excess of \$50,000 with equipment.

The Standard Ice Co., 921 Barber Street, Little Rock, Ark., has plans for a new electrically-operated ice-manufacturing plant at Hot Springs, Ark., to cost close to \$80,000 with machinery.

Buckley & Van Brunt, Gloyd Building, Kansas City, Mo., architects, have awarded a general contract to the Bickel Contracting Co., Pioneer Trust Building, for a two-story and basement plant, 100 x 130 ft., for the manufacture of waxed and process papers. It will cost approximately \$85,000 with equipment. The owner's name is temporarily withheld.

The Community Power & Light Co., Poplar Bluff, Mo., operating properties in this section, as well as Helena and Paragould, Ark.; Fort Scott, Kan., and other districts, is disposing of a bond issue of \$11,000,000, a portion of the fund to be used for extensions and improvements.

The Missouri Pacific Railroad Co., Railway Exchange Building, St. Louis, will soon begin the erection of a one-story machine shop, 50 x 126 ft., at Nevada, Mo., to cost about \$45,000 with equipment. E. M. Tucker is company architect.

The City Council, Ponca City, Okla., has engaged the Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., engineer, to prepare plans for extensions and improvements in the municipal electric power house, including installation of additional machinery, to cost close to \$300,000.

The Oklahoma Natural Gas Corporation, Tulsa, Okla., recently formed to take over properties at Tulsa, Sapulpa, Okmulgee and vicinity, is disposing of a bond issue of \$3,795,000, a portion of the fund to be used for expansion. R. C. Sharp is president.

The City Council, Brainard, Neb., plans the installation of pumping machinery in connection with improvements in the municipal waterworks. A steel tank and tower will be installed. Grant, Fulton & Letton, 525 South Thirteenth Street, Lincoln, Neb., are engineers.

The Steinite Laboratories, Inc., Atchison, Kan., manufacturer of radio equipment, is considering erection of a new two-story plant to cost close to \$30,000 with equipment.

The K. C. Garage Co., Tulsa, Okla., Kelley Connor, head, has plans for a four-story service, repair and garage building, 100 x 140 ft., estimated to cost \$110,000 with equipment. Frank C. Walters, 305 West Jasper Street, is architect.

The Nicholas-Beazley Airplane Co., 266 West North Street, Marshall, Mo., has been incorporated with a capital stock of \$25,000 to continue the manufacture of airplanes, supplies and parts. Plans have been prepared and the company expects to begin construction of a new factory within 60 days. It is in the market for 3½ per cent nickel steel machine bolts and nuts and for cold drawn low carbon steel tubing.

The Shelby Syndicate, Inc., 600 Shell Building, St. Louis, has moved its headquarters to suites 1151-53 Southwestern Bell Telephone Building.

Cleveland

CLEVELAND, Feb. 7.

MACHINE tool sales and inquiries improved considerably the past week. Dealers took a fair number of scattering orders from widely diversified industries, but almost wholly for single machines. Users as a rule are buying cautiously, limiting their purchases to tools for which they have immediate need. Absence of orders from the automotive industry is still a feature of the situation and because of this the Detroit market continues extremely dull.

The Crucible Steel Castings Co., 8401 Almira Avenue, Cleveland, has placed contract with the C. A. Carson Co. for a one-story foundry addition, 102 x 200 ft. The G. S. Ryder Co., 612 Century Building, is the architect.

The Akron Standard Mold Co., 1624 Englewood Avenue, Akron, Ohio, is taking bids for a 80 x 80-ft. factory addition.

The Canfield Oil Co., 3216 East Fifty-fifth Street, Cleveland, has taken bids for a new power plant. Thomas Maynz, 3326 Kenmore Road, is the engineer.

The Safety Stair Tread Co., Wooster, Ohio, has taken bids for two one-story factory additions, 110 x 140 ft. and 60 x 80 ft. respectively.

The A. H. Robinson Co., 5102 Detroit Avenue, Cleveland, has acquired a plant in Massillon, Ohio, which it will remodel for the manufacture of warm-air furnaces and other heating appliances. Some new sheet metal working equipment will probably be required. The present Cleveland plant will be retained as a branch. A. H. Robinson is president.

The Cleveland Railway Co. is preparing plans for a one-story repair shop, 100 x 175 ft., on West 117th Street. It is also contemplating the erection of two power substations and two terminals.

The plant to be erected by Wilson-Bohanon Co., Marlon, Ohio, will be 50 x 200 ft. Bids are being taken.

The Northern Ohio Traction & Light Co., Akron, Ohio, contemplates the erection of a steam heating plant to cost between \$600,000 and \$1,000,000. A. C. Brinn is vice-president and general manager.

The Hal-Fur Truck Co., 1783 East Twenty-first Street, Canton, Ohio, contemplates the erection of a one-story plant at an estimated cost of \$50,000. A. C. Fuhrman is vice-president.

The Board of Education, Cadiz, Ohio, plans the installation of manual training equipment in a proposed new high school estimated to cost \$250,000, for which bids have been asked on general contract. C. W. Bates, 77 Twelfth Street, Wheeling, W. Va., is architect.

Motors and other power equipment, conveying, elevating and other machinery will be installed in the new printing plant to be constructed by the *Beacon Journal*, 105 East Market Street, Akron, Ohio, estimated to cost \$450,000.

The Duroseal Corporation, 6511-15 Cedar Avenue, Cleveland, has been formed to manufacture Durator pistons and rings for internal combustion engines, Sealite pistons for compressors, pumps, hydraulic and compressed air machinery and other industrial uses and Rotorseal shaft packing for confining liquids or gases under pressure. The company will be in the market for equipment. J. N. Fleming is purchasing agent.

The National Malleable & Steel Castings Co. of Delaware, 10600 Quincy Avenue, Cleveland, has been organized with a capital of 12,000 shares of no par stock, to take over certain sales of its parent company, the National Malleable & Steel Casting Co. The new corporation will do no manufacturing at the present.

Pacific Coast

SAN FRANCISCO, Feb. 2.

ATRACT of 900 acres has been acquired at Torrance by the General Petroleum Corporation, Higgins Building, Los Angeles, as a site for a proposed oil refinery, to cost close to \$10,000,000 with machinery. A power house and machine shop will be built. The company is understood to be planning the removal of its present refinery at Vernon to the new location.

The Pacific Ice Co., 354 Pine Street, San Francisco, will soon begin the construction of a one-story ice-manufacturing plant at Oakland, to cost about \$50,000 with equipment.

The Los Angeles Furniture Co., 931 East Pico Street, Los Angeles, has filed plans for the erection of a new four-

story factory, 180 x 240 ft., to cost about \$160,000 with machinery. The John M. Cooper Co., Rives-Strong Building, is architect.

The Burr Creamery Co., Eighth and Towne Streets, Los Angeles, has plans under way for a one and two-story ice-manufacturing plant, 50 x 100 ft., at Glendale, Cal., to cost about \$45,000. B. B. Bixby, 2317 Somerset Drive, Los Angeles, is architect.

The Long-Bell Lumber Co., Longview, Wash., has plans under way for extensions and improvements in its power plant, to include the installation of a new 6000-kw. generator, boilers and auxiliary equipment. L. B. Beech is power engineer for the company. Roy F. Morse is general manager.

The Chiloquin Lumber Co., Klamath Falls, Ore., has plans under way for a new mill, including machine shop and power house, estimated to cost \$150,000. It will replace a structure destroyed by fire.

The Mesick & Mahy Mfg. Co., 1431 South Wall Street, Los Angeles, manufacturer of plated ware, silverware specialties, etc., will build a new three-story plant to cost about \$50,000. John J. Frauenfelder, Story Building, is architect.

The Merchants Ice & Cold Storage Co., Los Angeles, has plans for a new one-story ice-manufacturing plant to cost about \$60,000 with equipment. L. A. Parker, Kerckhoff Building, is architect.

The Standard Sheet Metal Works, 1601 Eastlake Avenue, Seattle, has plans for a one-story addition, estimated to cost \$15,000 with equipment.

The Santa Fe Railway Co., Kerckhoff Building, Los Angeles, has plans for new locomotive and car repair shops at Phoenix, Ariz., comprising engine house, machine shops, general repair shops and forge shop, estimated to cost \$150,000. The engineering department of the company is in charge.

Bisch & Salzman, 1837 East Sixteenth Street, Los Angeles, manufacturers of cabinets, etc., are arranging to rebuild their one-story plant, 129 x 175 ft., recently destroyed by fire. Additional equipment will be installed.

Construction was started Jan. 31 on the new foundry at the plant of C. F. Braun & Co., South Fremont Avenue, Alhambra, oil and absorption equipment. It will be 300 x 380 ft., and cost \$115,700.

The Community Ice Co., Long Beach, has started construction on a new \$84,000 ice plant at Hynes, 45 x 109 ft.

The Wall-Johnson Supply Co. has combined its offices and warehouse at 537 Sixth Street, San Francisco.

The Albert S. Knight Co., 2203 First Avenue South, Seattle, Wash., is now carrying a complete stock of fuses and kindred products manufactured by the Trico Fuse Mfg. Co., Milwaukee. A similar stock is carried for the Milwaukee company by the Coast Electric Supply Co., 222 South San Pedro Street, Los Angeles.

Canada

TORONTO, Feb. 7.

MACHINE tool sales are showing steady improvement, local dealers and builders reporting a good volume of orders for single tools. Inquiries from the automotive industry are increasing and several small lists were closed from this source the past week. The possibility of large rail and equipment orders being placed has had a tendency to strengthen the machine tool market, and as a consequence a number of companies likely to share in this business are putting their plants in shape to handle increased orders.

The Town Council, Canso, N. S., has authorized the expenditure of \$15,000 for the installation of a steam engine and boiler in the power plant.

C. H. Taylor, Toronto, has taken out a permit for the erection of a factory and machine shop at 193 King Street, East.

The Beaverboard Co., Thorold, Ont., proposes to build an addition to its local mills and install considerable new machinery.

Estimates of the Civic Works Department, Toronto, include the expenditure of \$52,000 for improvements at Ashbridges Bay, which will include the installation of a low-lift pumping plant.

W. Walberg, Toronto, head of the Lake St. John Paper & Power Co., which will establish paper mills and a power plant at Mistassini, Que., states that the plant will be ready to start production by January, 1928. The plans include a 20,000-hp. development plant and 200-ton paper mill.

The foundry and pattern shops owned by the Darling Brothers, Montreal, were destroyed by fire recently with a loss of \$75,000. The owners will rebuild and will require new tools and general equipment.

The Clement K. Quinn Ore Co., Duluth, Minn., has taken over the business and property of the Mountain Stone Co. at Fort William, Ont., and contemplates spending \$150,000 on the construction of a new stone-crushing plant.

The Canadian Westinghouse Co., Ltd., Sanford Avenue North, Hamilton, Ont., is contemplating the erection of an addition to its plant.

The Richards Wilcox Canadian Co., Ltd., Chelsea Green, London, Ont., has awarded a general contract to Hyatt Brothers, 290 Egerton Street, for a \$25,000 factory addition.

By-laws carried by the ratepayers of Hamilton, Ont., in connection with work to be carried out this year on the waterworks system, include the building of a 60-in. diameter intake pipe and conduit; suction well and screens and 48-in. diameter connecting conduit to pumping house at a cost of \$400,000; extension to the Beach pumping station, including new steam turbine pump, boiler, chimney, building and other changes to cost \$156,000; extension to the Ferguson Avenue pumping station for the high level and mountain districts to cost \$20,000. The city engineer is preparing plans, and work will be started soon.

Keenan Brothers, Ltd., Owen Sound, Ont., are in the market for a 10-hp., d.c. generator, 350 to 400 r.p.m.

The Arthur Jackson Machine Tool Co., Toronto, will be located in its new offices at 32-34 Front Street, W., Toronto 2, after March 1. It specializes in mass production machine tools, welding machines, threading machines, etc., and represents a number of American machine tool manufacturers in Canada.

Western Canada

The owners of the Independent Shingle Mill, New Westminster, B. C., whose factory was recently destroyed by fire, plans the erection of a new structure to cost \$50,000.

The Regina College, Regina, Sask., plans the erection of a power and light plant to cost \$35,000.

The Canadian Pacific Railway, head office at Montreal, proposes to build freight car shops at Winnipeg. J. C. Holden, Winnipeg, is district engineer.

Foreign

THE Lombard Electric Co., Milan, Italy, has disposed of a bond issue of \$6,000,000 in the United States, the proceeds to be used for extensions and improvements in hydro-electric generating plants and transmission systems, including the acquisition of existing properties. The company operates the Alto Brembo Co., a subsidiary.

The Postmaster General's Department, Australian Government, Melbourne, is asking bids until March 8 for electrical equipment, including induction coils, registers, etc. Specifications on file at the office of the Electrical Equipment Division, Bureau of Foreign and Domestic Commerce, Washington, reference EE No. 1026.

Bids are being asked (closing date not decided) by the Bureau of Yards and Docks, Washington, for a purification plant at the naval radio station, Darien, C. Z., including motor-driven centrifugal pump, elevated steel tank and tower, pressure filter, etc., Specification 5240.

The Agip Co., Rome, Italy, an oilfield operator, backed by the Italian Government, has secured a concession to operate on 875 acres in the oil districts of Rumania, including the Dambovitza and Rasvad districts, and will expend approximately 500,000,000 lire (about \$20,000,000) in this territory, including installation of machinery for drilling, construction of oil refineries, pipe lines, and storage and distributing plants.

The Cia. de Fuerza del Suroeste de Mexico, S. A., a subsidiary of the Mexican Light & Power Co., Ltd., Mexico City, Mexico, has a concession for the construction of a hydroelectric generating plant on the Lerma River, near El Oro, State of Michoacan, for power service to mining industries in this section, and will proceed with the project in the near future. The station will have an initial capacity of 30,000 hp., with ultimate output of about twice this amount. A high-tension transmission system will be built. The entire project will cost close to \$7,000,000. The Mexican Government is arranging for the construction of an irrigation system in the same district to cost more than \$1,500,000.

The Kloeckner Werke A. G., Duesseldorf, Germany, is at the head of a project to construct and operate a plant in the vicinity of Rauxel for the manufacture of a mixed nitrate-potash fertilizer, reported to cost in excess of \$400,000 with machinery. Peter Kloeckner heads the company.

THE LAST WORD

(Contributed by the Reader Service Department of the Iron Age Publishing Co.)

"Gentlemen, we shall see the time when the pig iron production of this country will be twenty million tons or more."



The speaker was Abram S. Hewitt, iron-master and one-time mayor of New York. The time was the early nineties, and the place was the old "Pig Iron Exchange" at 69 Wall Street, New York.

"We all thought he was not quite *compos mentis*," said our informant, who is still an active factor in the pig iron business. "But 1926 almost doubled Hewitt's forecast, with an output of close to forty million tons."

"Production has increased enormously in the past 34 years, and so has consumption, but where, oh where, can you find anything that has grown as fast as competition?" And he sighed as he bade us adieu.

Our Monday morning's mail was brightened by a letter containing a sweet three word combination, "Enclosed find check." Not content with that burst of sunshine, the writer added:

I have been a regular reader of your journal for the past twenty-six years and have found it to be the best of its kind, and I have read them all.

DANGER! LOOK OUT! BEWARE! When you visit some plants the plethora of warning signs arouses in you that same feeling of security and serenity you experience when inspecting a busy powder factory.

Thoughts of home, mother, and accident insurance crowd your cerebrum. You begin to wonder that anyone can work there a week and still retain the normal number of features and limbs.

"Danger signs increase rather than diminish the number of accidents," some students of accident prevention believe. They contend that anything that arouses fear is psychologically wrong, for fear and confusion, like Damon and Pythias, are twin souls.

Without using a single scare sign, the Commonwealth Steel Co., Granite City, Ill., as mentioned in our article, Jan. 27, on that company's employee-employer plan, has reduced its accident rate more than 80 per cent. The first factor in Commonwealth's safety code is carefulness, and the second and third factors are also carefulness.

All of which goes to prove that if you teach a man to be careful, you can keep him out of most kinds of trouble.

A. H. D.

